

PIBS 2897

DRINKING WATER SURVEILLANCE PROGRAM

**COBOURG
WATER TREATMENT
PLANT**

REPORT FOR 1991 AND 1992

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DRINKING WATER SURVEILLANCE PROGRAM
REPORT FOR 1991 AND 1992**

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EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

COBOURG WATER TREATMENT PLANT 1991 AND 1992 REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

The Cobourg water treatment plant is a conventional treatment plant which treats water from Lake Ontario. The process consists of coagulation, flocculation, clarification (upflow clarifier), filtration, and disinfection. This plant has a design capacity of $36.3 \times 1000 \text{ m}^3/\text{day}$. The Cobourg water treatment plant serves a population of approximately 15,000.

Water at the plant and at one location in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

Table A is a summary of all results by group.

No known health related guidelines were exceeded.

The Cobourg water treatment plant, for the sample years 1991 and 1992, produced good quality water and this was maintained in the distribution system.

TABLE A
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBourg WTP

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '-' INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	SITE		RAW		POSITIVE		TREATED		SHIRLEY ST	
	TESTS	%POSITIVE	TESTS	%POSITIVE	TESTS	%POSITIVE	TESTS	%POSITIVE	TESTS	%POSITIVE
BACTERIOLOGICAL	39	25	64	13	5	38	12	4	33	
CHEMISTRY (FIELD)	40	40	100	84	82	97	66	63	95	
CHEMISTRY (LABORATORY)	328	272	82	336	242	72	442	373	84	
METALS	336	102	30	335	96	28	506	202	39	
CHLORAROMATICS	154	0	0	140	0	0	126	0	0	
CHLOROPHENOLS	6	0	0	6	0	0	-	-	-	
PESTICIDES AND PCB	358	0	0	336	0	0	198	0	0	
PHENOLICS	14	1	7	14	1	7	-	-	-	
POLYAROMATIC HYDROCARBONS	51	0	0	34	0	0	34	0	0	
SPECIFIC PESTICIDES	26	0	0	26	0	0	-	-	-	
VOLATILES	420	0	0	420	56	13	358	48	13	
RADIONUCLIDES	7	1	14	7	2	28	-	-	-	
TOTAL	1,779	441		1,751	484		1,742	690		

DRINKING WATER SURVEILLANCE PROGRAM

COBOURG WATER TREATMENT PLANT 1991 AND 1992 REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

Appendix A has a full description of the DWSP.

The DWSP was initiated at the Cobourg water treatment plant in June, 1991. This is the first published report for the combined years of 1991 and 1992.

PLANT DESCRIPTION

The Cobourg water treatment plant is a conventional treatment plant which treats water from Lake Ontario. The process consists of coagulation, flocculation, clarification (upflow clarifier), filtration, and disinfection. This plant has a design capacity of $36.3 \times 1000 \text{ m}^3/\text{day}$. The Cobourg water treatment plant serves a population of approximately 15,000.

The sample day flows ranged from $10.5 \times 1000 \text{ m}^3/\text{day}$ to $17.9 \times 1000 \text{ m}^3/\text{day}$.

General plant information is presented in Table 1 and a schematic of plant processes, chemical addition points and sampling locations in Figure 1.

SAMPLING AND ANALYSES

Stringent DWSP sampling protocols were followed to ensure that all samples were collected in a uniform manner (see Appendix B).

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. Retention time was calculated by dividing the volume of water between two sampling points by sample day flow. For example, if it

was determined that retention time within the plant was five hours, then there would be a five hour interval between the raw and treated sampling. Similarly, if it was estimated that it took approximately one day for the water to travel from the plant to the distribution system site, this site would be sampled one day after the treated water from the plant.

To obtain a representative raw water sample, free from any added chemicals, at plants which used chlorine for zebra mussel control, the operator was required to turn off the chlorine feed to the mouth of the intake and allow enough time for the chlorinated water to clear from the intake works.

Plant operating personnel routinely analyzed parameters for process control (Table 2).

At all distribution system locations, two types of samples were obtained, a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service connection for a minimum of six hours. These samples were used to make an assessment of the change in the levels of inorganic compounds and metals due to leaching from, or deposition on, the plumbing system. The only analyses carried out on the standing samples, therefore, were laboratory chemistry and metals. The free flow sample represented fresh water from the distribution system main, since the sample tap was flushed for five minutes prior to sampling.

Water at the plant and at one location in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

RESULTS

Field measurements were recorded on the day of sampling and were entered onto the DWSP database as submitted by plant personnel.

Table 3 contains information on delay time between the raw and treated water sampling, flow rate, and treatment chemicals dosages.

Table 4 is a summary of all results by parameter and by water type. If a parameter was not detected, the total number of negative sample results is given. In contrast, if a parameter was detected at any location, the detailed results for all samples are provided.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment and Energy laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 lists all parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on Tables 4 and 5. Parameters are listed alphabetically within each scan.

DISCUSSION

GENERAL

Water quality was judged by comparison with the Ontario Drinking Water Objectives publication (ODWOs). When an Ontario Drinking Water Objective (ODWO) was not available, guidelines/limits from other agencies were used. These guidelines were obtained from the Parameter Listing System database.

The guidelines are evaluated on the results from the free flowing samples. Standing samples in the distribution system can show elevated concentrations in certain metals if the water is corrosive or if the standing time is excessive. Flushing the tap until the water achieves the coolest temperature will ensure that the water used for consumption will contain minimum concentrations of metals.

IN THIS REPORT, DISCUSSION IS LIMITED TO:

- THE TREATED AND DISTRIBUTED WATER;**
- ONLY THOSE PARAMETERS WITH CONCENTRATIONS ABOVE
GUIDELINE VALUES; AND**
- POSITIVE ORGANIC PARAMETERS DETECTED.**

BACTERIOLOGICAL

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality. Routine monitoring programs usually require that multiple samples be collected in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples. Standard plate count was the only bacteriological analysis conducted on the treated and distributed water. No results were above the guideline.

INORGANIC & PHYSICAL

CHEMISTRY (FIELD)

It is desirable that the temperature of drinking water be less than 15°C. The palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The temperature of delivered water may increase in the distribution system due to the warming effect of soil in late summer and fall and/or as a result of higher temperatures in the source water.

Field temperature exceeded the ODWO Aesthetic Objective of 15°C in 3 of 18 treated and distributed water samples with a maximum reported value of 17.5°C.

CHEMISTRY (LABORATORY)

The ODWOs indicate that a hardness level of between 80 and 100 mg/L as calcium carbonate for domestic waters provides an acceptable balance between corrosion and encrustation. Water supplies with a hardness greater than 200 mg/L are considered poor and possess a tendency to form scale deposits and result in excessive soap consumption.

Hardness exceeded the ODWO Recommended Operational Guideline of 80-100 mg/L in all 25 treated and distributed water samples with a maximum reported value of 138.4 mg/L.

METALS

At present, there is no evidence that aluminum is physiologically harmful and no health limit for drinking water has been specified. The measure of aluminum in treated water is important to measure the efficiency of the treatment process. The ODWOs indicate that a useful guideline is to maintain a residual below 100 ug/L as aluminum in the water leaving the plant to avoid problems in the distribution system.

Aluminum exceeded the ODWO Recommended Operational Guideline of 100 ug/L in 2 of 26 treated and distributed water samples with a maximum reported value of 140 ug/L.

The presence of elevated lead in the standing samples in the distribution system indicates that household taps should be flushed, until the coolest water temperature is obtained, before water is used for consumption. The concentration of lead and other metals can increase while the water is standing in the service line and home plumbing. The health related ODWO for lead is applied to the free flowing sample.

ORGANIC

CHLOROAROMATICS

The results of the chloroaromatic scan showed that none were detected above trace levels.

CHLOROPHENOLS

The results of the chlorophenol scan showed that none were detected.

PESTICIDES AND PCB

The results of the pesticide and PCB scan showed that none were detected above trace levels.

PHENOLICS

Phenolic compounds are present in the aquatic environment as a result of natural and/or industrial processes. The ODWOs have been revised to replace the aesthetic phenolic objective with objectives for specific phenols.

Phenolics were found at a positive level in 1 of the 14 treated and distributed water samples analyzed. The maximum observed level was 1.4 ug/L.

POLYAROMATIC HYDROCARBONS

The results of the polyaromatic hydrocarbon scan showed that none were detected.

SPECIFIC PESTICIDES

The results of the specific pesticide scan showed that none were detected.

VOLATILES

The detection of benzene, ethylbenzene, toluene and xylenes at low, trace levels may be a laboratory artifact derived from the analytical methodology. Trace levels of styrene are considered to be laboratory artifacts resulting from the sample shipping containers.

Trihalomethanes (THMs) are produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of chloroform, chlorodibromomethane and dichlorobromomethane. Bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs. Only total THM results are discussed. Starting in 1991, samples

from the distribution system were quenched with sodium thiosulphate to stop the further production of THMs in the sample bottle. This provided a more representative estimation of the THMs consumed in tap water.

Total trihalomethanes were found at positive levels in all 26 treated and distributed water samples analyzed. The maximum observed level was 29.4 ug/L. This was below the ODWO Maximum Acceptable Concentration of 350 ug/L.

RADIOLOGICAL

RADIONUCLIDES

There are more than 200 radionuclides, some of which occur naturally and others which originate from the activities of society. The radionuclides currently of greater interest from a health view-point are tritium, strontium-90, iodine-131, cesium-137 and radium-226. The gross beta and gross alpha determinations are suitable for preliminary screening except for tritium which must be measured separately. Radionuclides are measured in becquerels per litre (Bq/L). No results were above the available guidelines.

CONCLUSIONS

No known health related guidelines were exceeded.

The Cobourg water treatment plant, for the sample years 1991 and 1992, produced good quality water and this was maintained in the distribution system.

FIGURE 1

COBOURG WATER TREATMENT PLANT

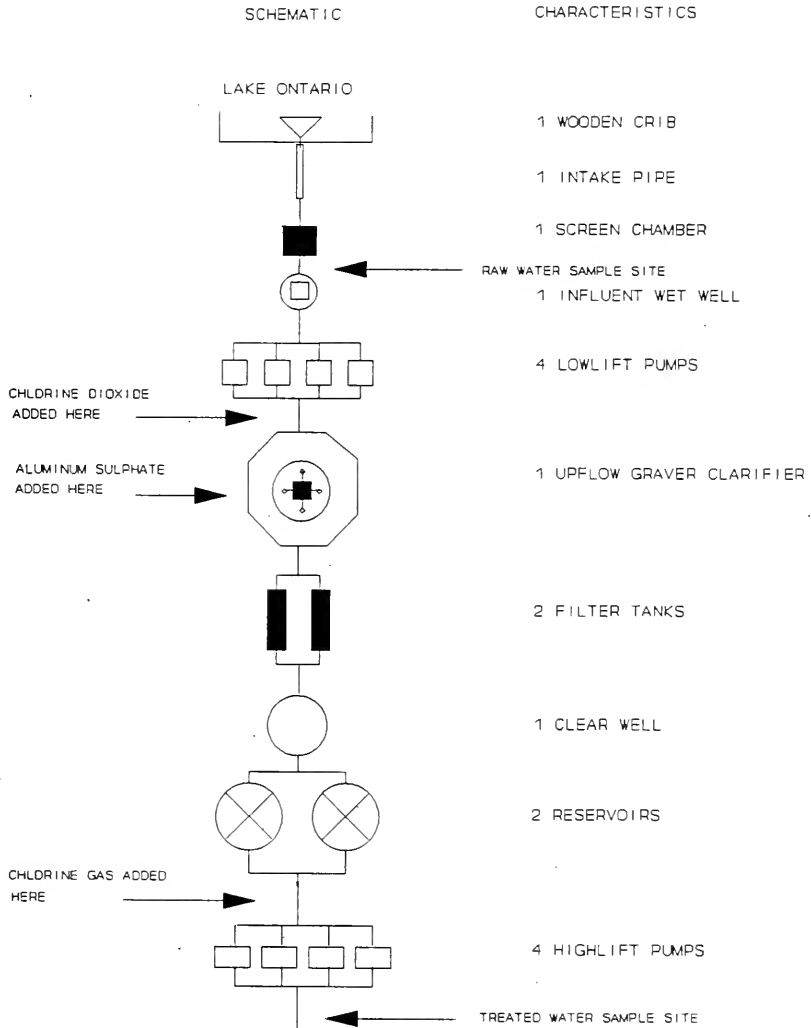


TABLE 1
DRINKING WATER SURVEILLANCE PROGRAM
PLANT GENERAL REPORT

PLANT NAME: COBOURG WTP
WORKS #: 220000825
UTM #: 177285954870450

DISTRICT: PETERBOROUGH
REGION: CENTRAL
DISTRICT OFFICER: J. BOURQUE

SUPERINTENDENT: C. ROSS

ADDRESS: 6 DARCY ST.
COBOURG, ONTARIO

416-372-3612

MUNICIPALITY: COBOURG
AUTHORITY: MUNICIPAL

PLANT INFORMATION

PLANT VOLUME:	7.710	(X 1000 M3)
DESIGN CAPACITY:	36.370	(X 1000 M3/DAY)
RATED CAPACITY:	-	(X 1000 M3/DAY)

MUNICIPALITY	POPULATION
-----	-----
COBOURG	15,000

TABLE 2
DRINKING WATER SURVEILLANCE PROGRAM
IN-PLANT MONITORING

PARAMETER -----	LOCATION -----	FREQUENCY -----
TOTAL CHLORINE RESIDUAL	LAB TREATED TREATED	EVERY 3 DAYS CONTINUOUS
PH	LAB RAW LAB SETTLED LAB FILTERED	VARIABLE VARIABLE VARIABLE
TURBIDITY	LAB RAW LAB SETTLED LAB FILTERED CLARIFIER FILTERED	WEEKLY WEEKLY WEEKLY CONTINUOUS CONTINUOUS

TABLE 3
DRINKING WATER SURVEILLANCE PROGRAM COBORG WTP SAMPLE DAY CONDITIONS
AND TREATMENT CHEMICAL DOSAGES FOR 1991 AND 1992

DATE	DELAY * TIME(HRS)	FLOW (1000M3)	PRE CHLORINATION CHLORINE	COAGULATION ALUM LIQUID	POST CHLORINATION CHLORINE
91 JUN 17	.00	12.040	.	36.00	.52
91 AUG 06	3.00	17.921	.	23.90	.56
91 SEP 30	.25	13.870	.	13.90	1.30
91 OCT 22	.25	12.125	.	9.00	1.10
91 NOV 19	24.00	12.992	.	15.40	1.00
92 JAN 21	1.20	13.872	1.40	24.40	1.40
92 FEB 18	1.30	14.442	1.03	24.07	1.03
92 MAR 16	1.30	13.630	.80	19.30	1.20
92 MAY 20	1.30	16.035	.84	37.90	.84
92 JUN 15	.00	.000	.	32.90	1.30
92 SEP 22	1.50	12.620	.70	39.60	1.00
92 NOV 23	1.50	10.550	.	30.20	.

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.

KEY TO TABLE 4 and 5

- A ONTARIO DRINKING WATER OBJECTIVES (ODWO)
 1. Maximum Acceptable Concentration (MAC)
 1+. MAC for Total Trihalomethanes
 2. Interim Maximum Acceptable Concentration (IMAC)
 3. Aesthetic Objective (AO)
 3*. AO for Total Xylenes
 4. Recommended Operational Guideline
 5. Health Related Guidance Value
- B HEALTH & WELFARE CANADA (H&W)
 1. Maximum Acceptable Concentration (MAC)
 2. Proposed MAC
 3. Interim MAC
 4. Aesthetic Objective (AO)
- C WORLD HEALTH ORGANIZATION (WHO)
 1. Guideline Value (GV)
 2. Tentative GV
 3. Aesthetic GV
- D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
 1. Maximum Contaminant Level (MCL)
 2. Suggested No-Adverse Effect Level (SNAEL)
 3. Lifetime Health Advisory
 4. EPA Ambient Water Quality Criteria
- F EUROPEAN ECONOMIC COMMUNITY (EEC)
 1. Health Related Guideline Level
 2. Aesthetic Guideline Level
 3. Maximum Admissable Concentration (MADC)
- G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE
- I NEW YORK STATE AMBIENT WATER GUIDELINE
- N/A NONE AVAILABLE

LABORATORY RESULTS, REMARK DESCRIPTIONS

. No Sample Taken

BDL Below Minimum Measurement Amount

<T Greater Than Detection Limit But Not Confident
(SEE INTERPRETATION OF RESULTS ABOVE)

> Results Are Greater Than The Upper Limit

<=> Approximate Result

!48 No Data: Sample Age Exceeded 48 Hours

!AR No Data: No Numeric Results

!AW No Data: Analysis Withdrawn

!BT No Data: Sample Broken In Transit

!CS No Data: Contamination Suspected

!EF No Data: Laboratory Equipment Failure

!IR No Data: Insufficient Sample

!IS No Data: Insufficient Sample

!LA No Data: Laboratory Accident

!NP No Data: No Procedure

!NR No Data: Sample Not Received

!OP No Data: Obscured Plate

!PE No Data: Procedure Error: Sample Discarded

!PR No Data: Preservative Required

!QU No Data: Quality Control Unacceptable

!RE No Data: Received Empty

!RO No Data: No Numeric Results

!SM No Data: Sample Missing

!SS No Data: Sample Improperly Preserved

!U No Data: Sample Unsuitable For Analysis

!UB No Data: Bottle Broken

!UN No Data: Result Unreliable

!UR	No Data: Unpreserved Sample Required
A	Approximate Value
A3C	Approximate, Total Count Exceeded 300 Colonies
A>	Approximate Value, Exceeded Normal Range
APS	Additional Peak, Less Than, Not Priority Pollutant
ARO	Additional Information In Laboratory Report
CRO	Calculated Result Only
NAF	Not All Required Tests Found
RID	Ioncal Calculated on Incomplete Data Set
RMP	P and M-Xylene Not Separated
RRR	Result Obtained by Repeat Analysis
RRV	Rerun Verification
SFA	Sample Filtered: Filtrate Analyzed
SIL	Sample Incorrectly Labelled
SPS	Several Peaks, Small, Not Priority Pollutant
U48	Unreliable: Sample Age Exceeded 48 Hours
UAL	Unreliable: Sample Age Exceeded Limit
UAU	Unreliable: Sample Age Unknown
UCS	Unreliable: Contamination Suspected
WSD	Wrong Sample Description On Bottle

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBourg WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING	
BACTERIOLOGICAL				
FECAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0		GUIDELINE = 0 (A1)
1991 JUN	BDL	.	.	.
1991 JUL	0	.	.	.
1991 AUG	4	.	.	.
1991 SEP	BDL	.	.	.
1991 OCT	1	.	.	.
1991 NOV	1	.	.	.
1992 JAN	5	.	.	.
1992 FEB	0	.	.	.
1992 MAR	0	.	.	.
1992 APR	0	.	.	.
1992 MAY	0	.	.	.
1992 SEP	3	.	.	.
1992 NOV	0	.	.	.
STANDARD PLATE CNT MF (CT/ML)				
		DET'N LIMIT = 0		GUIDELINE = 500 (A3)
1991 JUN	.	1 <=>	4 <=>	.
1991 JUL	.	8 <=>	3 <=>	.
1991 AUG	.	3 <=>	5 <=>	.
1991 SEP	.	5 <=>	1 <=>	.
1991 OCT	.	0 <=>	20	.
1991 NOV	.	10	9 <=>	.
1992 JAN	.	13	2 <=>	.
1992 FEB	.	17	21	.
1992 MAR	.	5 <=>	5 <=>	.
1992 APR	.	5 <=>	.	.
1992 MAY	.	14	10	.
1992 SEP	.	230	65	.
1992 NOV	.	5 <=>	1 <=>	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING	
BACTERIOLOGICAL					
TOTAL COLIFORM MF (CT/100ML)			DET'N LIMIT = 0		GUIDELINE = 5/100ML (A1)
1991 JUN	4				
1991 JUL	BDL				
1991 AUG	16 A3C				
1991 SEP	BDL				
1991 OCT	BDL				
1991 NOV	28				
1992 JAN	64				
1992 FEB	4				
1992 MAR	4				
1992 APR	BDL				
1992 MAY	6				
1992 SEP	30 <=>				
1992 NOV	70 <=>				
T COLIFORM BCKGRD MF (CT/100ML)			DET'N LIMIT = 0		GUIDELINE = N/A
1991 JUN	188				
1991 JUL	960				
1991 AUG	5200 A3C				
1991 SEP	1880 A3C				
1991 OCT	8400 A3C				
1991 NOV	960				
1992 JAN	440				
1992 FEB	64				
1992 MAR	92				
1992 APR	24				
1992 MAY	188				
1992 SEP	6600 A3C				
1992 NOV	2400				

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
CHEMISTRY (FIELD)			
FLO CHLORINE (COMB) (MG/L)		DET'N LIMIT = 0	GUIDELINE = N/A
1991 JUN	.200	.000	.000
1991 JUL	.500	.	.020
1991 AUG	.300	.	.
1991 SEP	.200	.100	.
1991 OCT	.200	.200	.
1991 NOV	.200	.	.000
1991 DEC	.200	.	.200
1992 JAN	.100	.	.010
1992 FEB	.200	.	.200
1992 MAR	.200	.	.
1992 APR	.100	.	.
1992 MAY	.000	.	.
1992 JUN	.300	.	.
1992 JUL	.100	.100	.
1992 SEP	.200	.	.100
1992 OCT	.	.	.
1992 NOV	.	.	.
FLO CHLORINE FREE (MG/L)		DET'N LIMIT = 0	GUIDELINE = N/A
1991 JUN	.200	.200	.
1991 JUL	.000	.	.200
1991 AUG	.200	.	.010
1991 SEP	.400	.200	.
1991 OCT	.400	.100	.
1991 NOV	.600	.	.200
1991 DEC	.400	.	.200
1992 JAN	.500	.	.020
1992 FEB	.420	.	.200
1992 MAR	.500	.	.
1992 APR	.600	.	.
1992 MAY	.300	.	.
1992 JUN	.400	.100	.
1992 JUL	.400	.	.100
1992 SEP	.	.	.
1992 OCT	.	.	.
1992 NOV	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
CHEMISTRY (FIELD)			
FLD CHLORINE (TOTAL) (MG/L)	DET'N LIMIT = 0		GUIDELINE = N/A
1991 JUN	.400	.200	.200
1991 JUL	.500	.	.030
1991 AUG	.500	.300	.
1991 SEP	.600	.300	.200
1991 OCT	.600	.	.400
1991 NOV	.800	.	.030
1992 JAN	.600	.	.400
1992 FEB	.600	.	.
1992 MAR	.620	.	.
1992 APR	.600	.	.
1992 MAY	.600	.	.
1992 JUN	.600	.200	.
1992 SEP	.500	.	.200
1992 NOV	.600	.	.
FLD PH (OMNSLESS)	DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5 (A4)
1991 JUN	7.200	7.400	7.300
1991 JUL	7.400	.	7.400
1991 AUG	7.500	.	.
1991 SEP	7.200	7.200	.
1991 OCT	7.400	7.400	7.400
1991 NOV	7.500	.	7.200
1992 JAN	7.400	.	7.020
1992 FEB	7.400	.	7.100
1992 MAR	7.400	.	.
1992 APR	7.700	.	.
1992 MAY	7.600	.	.
1992 JUN	7.400	.	.
1992 SEP	7.600	7.200	.
1992 NOV	7.600	.	7.400

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
CHEMISTRY (FIELD)			
FLO TEMPERATURE (DEG.C)		DET'N LIMIT = N/A	GUIDELINE = 15 (A3)
1991 JUN	1,500	4,000	
1991 JUL	6,000	10,000	11,000
1991 AUG	10,000	13,000	14,000
1991 SEP	7,000	10,000	
1991 OCT	10,000	12,500	
1991 NOV		5,000	7,000
1992 JAN	3,000	3,000	2,500
1992 FEB	2,000	3,000	3,200
1992 MAR	2,000	2,000	3,000
1992 APR	4,000	5,000	
1992 MAY	8,000		
1992 JUN		10,000	
1992 SEP	15,000	16,500	
1992 NOV	9,000		14,000
FLO TURBIDITY (FTU)			
		DET'N LIMIT = N/A	GUIDELINE = 1.0 (A1)
1991 JUN	1,600	.220	
1991 JUL	2,000	.450	.200
1991 AUG	1,000	.280	.300
1991 SEP	1,600	.200	
1991 OCT	1,200	.350	
1991 NOV	2,400	.280	.240
1992 JAN	3,000	.170	.250
1992 FEB	.750	.220	.240
1992 MAR	2,100	.180	.260
1992 APR	1,200	.250	
1992 MAY	2,700	.350	
1992 JUN	1,300	.250	
1992 SEP	1,000	.290	
1992 NOV	2,500	.130	.350

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING	CHEMISTRY (LABORATORY)	
				DET'N LIMIT = 0.2	GUIDELINE = 30-500 (A4)
ALKALINITY (MG/L)					
1991 JUN	102.500	96.300	96.400		
1991 JUL	102.600	95.100	95.800		96.200
1991 AUG	102.100	97.100	97.700		97.300
1991 SEP	101.000	93.800	94.900		
1991 OCT	97.800	93.800	93.000		93.100
1991 NOV	100.000	94.500	94.500		94.600
1992 JAN	97.500	92.000	92.900		92.400
1992 FEB	95.600	92.300	94.900		93.600
1992 MAR	99.900	93.400	94.700		94.400
1992 APR	99.500	91.200			
1992 MAY	99.900	87.300	87.500		88.700
1992 JUN	102.100	92.200			
1992 SEP	99.600	86.400	90.600		89.600
1992 NOV	100.300	91.600			93.100
CALCIUM (MG/L)					
				DET'N LIMIT = 0.20	GUIDELINE = 100 (F2)
1991 JUN	38.600	40.000	39.400		
1991 JUL	40.200	39.800	40.600		40.400
1991 AUG	40.400	40.800	40.200		40.200
1991 SEP	41.200	41.000	40.700		
1991 OCT	38.500	37.600	38.600		39.000
1991 NOV	39.900	40.000	40.100		39.600
1992 JAN	37.800	38.500	37.000		38.600
1992 FEB	35.400	35.900	36.500		36.900
1992 MAR	39.800	40.500	41.000		41.000
1992 APR	38.950	39.900			
1992 MAY	39.000	39.100	39.000		39.600
1992 JUN	38.800	38.700			
1992 SEP	38.200	37.500	39.300		39.500
1992 NOV	38.250	39.500			39.850
CYANIDE (MG/L)					
				DET'N LIMIT = 0.001	GUIDELINE = 0.2 (A1)
20 SAMPLES BOL BOL BOL					

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBOURG WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	CHEMISTRY (LABORATORY)		DIST. SYSTEM SHIRLEY ST FREE FLOW		DIST. SYSTEM SHIRLEY ST STANDING	
CHLORIDE (MG/L)					DET'N LIMIT = 0.20		GUIDELINE = 250 (A3)	
1991 JUN	21.800	23.000		23.000		23.000		23.000
1991 JUL	22.000	22.800		23.000		23.000		24.000
1991 AUG	22.900	23.800		24.000		22.500		
1991 SEP	21.700	22.600		22.900		22.900		22.700
1991 OCT	22.100	23.200		22.900		23.200		23.200
1991 NOV	22.200	23.100		23.300		22.800		23.500
1992 JAN	22.700	23.600		23.000		23.000		22.800
1992 FEB	21.900	23.000		23.000		23.100		23.100
1992 MAR	21.800	23.000		22.500		22.600		22.600
1992 APR	21.800	22.800		22.700		22.600		22.600
1992 MAY	22.600	22.600				23.600		23.600
1992 JUN	21.900	22.800						
1992 SEP	21.400	23.000						
1992 NOV	21.400	23.000						
COLOUR (HZU)			DET'N LIMIT = 0.50		GUIDELINE = 5 (A3)			
1991 JUN	1.000 <T	.500 <T		.500 <T		1.000		1.000
1991 JUL	1.000 <T	.500 <T		1.000		1.000		1.500
1991 AUG	2.000	.500 <T		1.000 <T		1.000 <T		
1991 SEP	1.000 <T	1.000 <T		1.000 <T		1.000 <T		1.000 <T
1991 OCT	1.000	.500 <T		.500 <T		.500 <T		.500 <T
1991 NOV	.500 <T	.500 <T		1.000 <T		1.000 <T		1.000 <T
1992 JAN	1.500	B0L		.500 <T		.500 <T		.500 <T
1992 FEB	1.000 <T	.500 <T		1.000 <T		1.000 <T		.500 <T
1992 MAR	1.500	.500 <T		1.000 <T		1.000 <T		1.000 <T
1992 APR	1.000 <T	.500 <T		1.000 <T		.500 <T		.500 <T
1992 MAY	1.000	B0L		.500 <T		4.500		1.000 <T
1992 JUN	1.500	.500 <T		1.000 <T		1.500		1.500
1992 SEP	1.500	B0L		.500 <T				
1992 NOV	2.000	.500 <T						

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING	
CHEMISTRY (LABORATORY)				
CONDUCTIVITY (UMHO/CM)	DET'N LIMIT = 1.0			GUIDELINE = 400 (F2)
1991 JUN	321	325	325	
1991 JUL	320	325	326	327
1991 AUG	320	321	322	321
1991 SEP	319	323	325	
1991 OCT	315	314	313	313
1991 NOV	315	318	318	319
1992 JAN	327	333	332	333
1992 FEB	324	328	328	331
1992 MAR	316	324	328	327
1992 APR	311	318		
1992 MAY	311	318	318	320
1992 JUN	321	329		
1992 SEP	309	316	319	319
1992 NOV	314	323		326
DISS ORG CARBON (MG/L)				GUIDELINE = 5.0 (A3)
	DET'N LIMIT = 0.10			
1991 JUN	1.800	1.500	1.300	
1991 JUL	1.800	1.600	1.700	1.700
1991 AUG	1.800	1.700	1.700	1.600
1991 SEP	1.600	1.300	1.600	
1991 OCT	1.800	1.900	1.800	1.700
1991 NOV	1.800	1.700	1.700	1.600
1992 JAN	2.000	1.500	1.500	1.500
1992 FEB	1.600	1.400	1.200	1.400
1992 MAR	2.100	1.500	1.400	1.600
1992 APR	2.000	1.500		
1992 MAY	2.100	1.200	1.300	1.300
1992 JUN	1.600	1.300		
1992 SEP	2.000	1.500	1.300	1.400
1992 NOV	1.900	1.400		1.400

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	CHEMISTRY (LABORATORY)		DET'N LIMIT = 0.01	GUIDELINE = 1.5 (A1)
		FLUORIDE (MG/L)	HARDNESS (MG/L)		
1991 JUN	.100	.100	.100	.100	.100
1991 JUL	.120	.120	.120	.100	.120
1991 AUG	.120	.120	.120	.100	.100
1991 SEP	.120	.100	.100	.120	.120
1991 OCT	.120	.120	.120	.080	.120
1991 NOV	.120	.120	.120	.120	.120
1992 JAN	.140	.140	.140	.120	.120
1992 FEB	.120	.120	.120	.100	.100
1992 MAR	.120	.120	.120	.120	.120
1992 APR	.140	.140	.140	.100	.100
1992 MAY	.120	.120	.120	.100	.100
1992 JUN	.140	.140	.140	.100	.100
1992 SEP	.100	.100	.100	.080	.080
1992 NOV	.100	.100	.100	.080	.080
HARDNESS (MG/L)					
1991 JUN	131.000	135.000	133.000	133.000	135.000
1991 JUL	135.000	135.000	135.000	135.000	135.000
1991 AUG	134.000	134.000	132.000	132.000	132.000
1991 SEP	138.000	138.400	137.600	137.600	131.000
1991 OCT	131.300	129.700	132.000	132.000	133.200
1991 NOV	134.700	133.500	134.400	134.400	131.800
1992 JAN	129.400	132.100	127.700	127.700	127.000
1992 FEB	123.000	125.000	126.000	126.000	127.000
1992 MAR	135.000	137.000	138.000	138.000	138.000
1992 APR	132.100	134.400	134.400	134.400	134.000
1992 MAY	132.000	133.000	132.000	132.000	134.000
1992 JUN	132.000	132.000	132.000	132.000	134.000
1992 SEP	131.000	129.520	133.000	133.000	134.290
1992 NOV	130.300	133.290	133.290	133.290	134.290

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
CHEMISTRY (LABORATORY)			
IONCAL (OMNSLESS)	DET'N LIMIT = N/A		GUIDELINE = N/A
1991 JUN	1.850 NAF	1.408 NAF	1.689 NAF
1991 JUL	.207 NAF	.885 NAF	2.968
1991 AUG	1.798	1.298	1.469 NAF
1991 SEP	1.440 NAF	1.484 NAF	.585 NAF
1991 OCT	1.883	2.233	.714
1991 NOV	.098	1.105	1.820
1992 JAN	1.775	1.706	1.081
1992 FEB	4.009	4.127	3.684
1992 MAR	3.123	2.691	2.683
1992 APR	.968	1.309	.923
1992 MAY	.054	1.837	.923
1992 JUN	.740 NAF	.892 NAF	1.410
1992 SEP	.650	.075	1.946
1992 NOV	1.555	.859	
POTASSIUM (MG/L)	DET'N LIMIT = 0.01		GUIDELINE = 10 (F2)
1991 JUN	1.600	1.500	1.400
1991 JUL	1.450	1.400	1.500
1991 AUG	1.500	1.550	1.450
1991 SEP	1.380	1.390	1.370
1991 OCT	1.460	1.460	1.490
1991 NOV	1.390	1.410	1.380
1992 JAN	1.450	1.450	1.500
1992 FEB	1.400	1.480	1.470
1992 MAR	1.520	1.560	1.570
1992 APR	1.523	1.524	
1992 MAY	1.540	1.530	1.520
1992 JUN	1.490	1.640	1.510
1992 SEP	1.520	1.535	1.513
1992 NOV	1.499	1.497	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
CHEMISTRY (LABORATORY)			
LANGELIERS INDEX (OMNSLESS)	DET'N LIMIT = N/A	GUIDELINE = N/A	
1991 JUN	.474	.422	.306
1991 JUL	.472 NAF	.174 NAF	.156 NAF
1991 AUG	.322	.134	.191
1991 SEP	.386	.281	.263
1991 OCT	.393	.345	.272
1991 NOV	.358	.094	.205
1992 JAN	.373	.255	.252
1992 FEB	.506	.356	.425
1992 MAR	.537	.294	.355
1992 APR	.476	.278	.122
1992 MAY	.498	.040	.090
1992 JUN	.394	.218	.176
1992 SEP	.428	.228	.136
1992 NOV	.431	.125	
MAGNESIUM (MG/L)			
1991 JUN	8.300	8.500	8.600
1991 JUL	8.400	8.500	8.200
1991 AUG	7.900	7.900	7.800
1991 SEP	8.500	8.750	8.700
1991 OCT	8.550	8.650	8.600
1991 NOV	8.550	8.200	8.300
1992 JAN	8.500	8.750	8.350
1992 FEB	8.370	8.620	8.600
1992 MAR	8.710	8.470	8.430
1992 APR	8.450	8.680	8.650
1992 MAY	8.480	8.420	8.510
1992 JUN	8.550	8.480	8.410
1992 SEP	8.600	8.540	8.610
1992 NOV	8.440	8.730	8.440
DET'N LIMIT = 0.1			
GUIDELINE = 30.0 (F2)			

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
CHEMISTRY (LABORATORY)			
SODIUM (MG/L)		DET'N LIMIT = 0.20	GUIDELINE = 200 (A4)
1991 JUN	12.400	12.600	11.400
1991 JUL	11.800	11.200	11.800
1991 AUG	12.000	11.800	11.800
1991 SEP	11.200	11.300	11.500
1991 OCT	11.900	11.800	12.200
1991 NOV	11.500	11.000	11.300
1992 JAN	12.200	11.800	11.800
1992 FEB	11.500	12.100	12.200
1992 MAR	12.700	12.800	12.700
1992 APR	12.010	12.010	12.100
1992 MAY	12.000	12.100	12.100
1992 JUN	11.900	12.100	12.000
1992 SEP	12.100	11.990	11.730
1992 NOV	11.560	11.620	
AMMONIUM TOTAL (MG/L)		DET'N LIMIT = 0.002	GUIDELINE = 0.05 (F2)
1991 JUN	.002 <T	BDL	.002 <T
1991 JUL	.026	BDL	.004 <T
1991 AUG	.008 <T	.002 <T	.004 <T
1991 SEP	BDL	.002 <T	BDL
1991 OCT	.006 <T	BDL	BDL
1991 NOV	BDL	BDL	BDL
1992 JAN	.006 <T	BDL	.004 <T
1992 FEB	.004 <T	.004 <T	.004 <T
1992 MAR	.010	.004 <T	.004 <T
1992 APR	.010	.002 <T	.004 <T
1992 MAY	.008 <T	.002 <T	.008 <T
1992 JUN	.032	.006 <T	.012
1992 SEP	.008 <T	.008 <T	
1992 NOV	.008 <T	.006 <T	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
CHEMISTRY (LABORATORY)			
NITRITE (MG/L)	DET'N LIMIT = 0.001		GUIDELINE = 1.0 (A1)
1991 JUN	.003 <T	BDL	BDL
1991 JUL	.003 <T	BDL	.001 <T
1991 AUG	.006	BDL	.001 <T
1991 SEP	.001 <T	BDL	.002 <T
1991 OCT	.003 <T	.001 <T	BDL
1991 NOV	BDL	BDL	BDL
1992 JAN	.001 <T	BDL	BDL
1992 FEB	.002 <T	BDL	BDL
1992 MAR	.003 <T	.001 <T	.001 <T
1992 APR	.006	.004 <T	.001 <T
1992 MAY	.004 <T	.001 <T	.001 <T
1992 JUN	.001 <T	BDL	.001 <T
1992 SEP	.008	BDL	.002 <T
1992 NOV	.004 <T	BDL	.002 <T
NITRATE (TOTAL) (MG/L)			
DET'N LIMIT = 0.005		GUIDELINE = 10.0 (A1)	
1991 JUN	.350	.350	.330
1991 JUL	.330	.330	.305
1991 AUG	.360	.300	.240
1991 SEP	.400	.405	.375
1991 OCT	.305	.250	.390
1991 NOV	.370	.375	.375
1992 JAN	.395	.390	.395
1992 FEB	.375	.395	.375
1992 MAR	.390	.385	.315
1992 APR	.335	.345	.315
1992 MAY	.305	.320	.315
1992 JUN	.335	.330	.315
1992 SEP	.255	.285	.300
1992 NOV	.290	.305	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992				
TABLE 4				
TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING	
CHEMISTRY (LABORATORY)				GUIDELINE
NITROGEN TOT KJELD (MG/L)				DET'N LIMIT = 0.02
1991 JUN	.370	.210	.270	.200
1991 JUL	.250	.180	.220	.180
1991 AUG	.220	.200	.170	.130
1991 SEP	.160	.130	.130	.190
1991 OCT	.270	.170	.170	.150
1991 NOV	.190	.130	.140	.170
1992 JAN	.250	.170	.150	.140
1992 FEB	.190	.120	.200	.180
1992 MAR	.220	.200	.160	.140
1992 APR	.220	.150	.130	.170
1992 MAY	.220	.160	.170	.150
1992 JUN	.300	.150	.140	.170
1992 SEP	.210	.140	.170	.150
1992 NOV	.280	.150	.170	.170
PH (DIMLESS)				GUIDELINE
				DET'N LIMIT = N/A
1991 JUN	8.320	8.280	8.170	7.980
1991 JUL	8.300	8.040	8.010	8.040
1991 AUG	8.150	7.980	8.040	8.190
1991 SEP	8.210	8.140	8.120	8.050
1991 OCT	8.260	8.240	8.160	8.140
1991 NOV	8.200	7.960	8.070	8.270
1992 JAN	8.250	8.150	8.160	8.170
1992 FEB	8.420	8.280	8.330	
1992 MAR	8.380	8.160	8.210	
1992 APR	8.330	8.160		8.020
1992 MAY	8.350	7.950	8.000	
1992 JUN	8.240	8.110		8.070
1992 SEP	8.290	8.160	8.140	
1992 NOV	8.290	8.010		8.010

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING	
CHEMISTRY (LABORATORY)				
PHOSPHORUS FIL REACT (MG/L)		DET'N LIMIT = 0.0005	GUIDELINE = N/A	
1991 JUN	.001 <T	BDL	.	
1991 JUL	.000 <T	.000 <T	.	
1991 AUG	.000 <T	BDL	.	
1991 SEP	.000 <T	BDL	.	
1991 OCT	.000 <T	.000 <T	.	
1991 NOV	.000 <T	BDL	.	
1991 DEC	.001 <T	BDL	.	
1992 JAN	BDL	BDL	.	
1992 FEB	BDL	BDL	.	
1992 MAR	BDL	BDL	.	
1992 APR	BDL	BDL	.	
1992 MAY	BDL	BDL	.	
1992 JUN	BDL	BDL	.	
1992 JUL	BDL	BDL	.	
1992 SEP	BDL	BDL	.	
1992 NOV	.001 <T	BDL	.	
PHOSPHORUS TOTAL (MG/L)				
		DET'N LIMIT = 0.002	GUIDELINE = 0.40 (F2)	
1991 JUN	.015	.002 <T	.	
1991 JUL	.009 <T	.002 <T	.	
1991 AUG	.004 <T	BDL	.	
1991 SEP	.005 <T	BDL	.	
1991 OCT	.012	.005 <T	.	
1991 NOV	.007 <T	BDL	.	
1992 JAN	.012	BDL	.	
1992 FEB	.007 <T	BDL	.	
1992 MAR	.008 <T	.004 <T	.	
1992 APR	.002 <T	BDL	.	
1992 MAY	.007 <T	.002 <T	.	
1992 JUN	.018	.006 <T	.	
1992 JUL	.004 <T	BDL	.	
1992 SEP	.015	.002 <T	.	

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
CHEMISTRY (LABORATORY)			
RESIDUE FILTRATE (MG/L)		DET'N LIMIT = N/A	GUIDELINE = 500 (A3)
1991 JUN	209,000 CRO	211,000 CRO	213,000 CRO
1991 JUL	208,000 CRO	212,000 CRO	209,000 CRO
1991 AUG	208,000 CRO	209,000 CRO	209,000 CRO
1991 SEP	207,000 CRO	210,000 CRO	203,000 CRO
1991 OCT	205,000 CRO	204,000 CRO	203,000 CRO
1991 NOV	205,000 CRO	207,000 CRO	207,000 CRO
1992 JAN	213,000 CRO	216,000 CRO	216,000 CRO
1992 FEB	211,000 CRO	213,000 CRO	215,000 CRO
1992 MAR	205,000 CRO	211,000 CRO	213,000 CRO
1992 APR	202,000 CRO	207,000 CRO	208,000 CRO
1992 MAY	202,000 CRO	207,000 CRO	207,000 CRO
1992 JUN	209,000 CRO	214,000 CRO	212,000 CRO
1992 SEP	201,000 CRO	207,000 CRO	207,000 CRO
1992 NOV	204,000 CRO	210,000 CRO	212,000 CRO
SULPHATE (MG/L)		DET'N LIMIT = 0.20	GUIDELINE = 500 (A3)
1991 JUN	26,820	30,600	33,130
1991 JUL	26,890	33,050	31,250
1991 AUG	27,460	30,980	31,770
1991 SEP	27,610	33,760	32,440
1991 OCT	30,680	31,720	32,730
1991 NOV	27,910	31,360	32,140
1992 JAN	28,400	34,230	33,470
1992 FEB	26,610	32,100	37,010
1992 MAR	26,590	33,660	35,740
1992 APR	25,990	34,220	35,890
1992 MAY	26,410	36,080	
1992 JUN	25,830	34,620	
1992 SEP	26,180	36,300	
1992 NOV	27,100	35,240	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
CHEMISTRY (LABORATORY)			
TURBIDITY (FTU)		DET'N LIMIT = 0.05	GUIDELINE = 1.0 (A1)
1991 JUN	1,400	.110	.060
1991 JUL	1,000	.130	.150
1991 AUG	.880	.230	.210
1991 SEP	.950	.060 <T	.240
1991 OCT	5,000	.220 <T	.120 <T
1991 NOV	2,400	.180 <T	.250
1992 JAN	2,600	.210 <T	.180 <T
1992 FEB	1,330	.060 <T	.270
1992 MAR	.940	.240 <T	.180 <T
1992 APR	1,160	.190 <T	.090 <T
1992 MAY	2,700	.170 <T	.100 <T
1992 JUN	1,610	.240 <T	.200 <T
1992 SEP	1,670	.120 <T	.140 <T
1992 NOV	5,800	.140 <T	.300
			.220 <T

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING	GUIDELINE = N/A	
METALS					DET'N LIMIT = 0.05	DET'N LIMIT = 0.10
SILVER (UG/L)					GUIDELINE = N/A	
1991 JUN	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUL	BDL	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL	BDL
1991 SEP	BDL	BDL	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL	BDL
1992 JAN	BDL	BDL	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAR	BDL	BDL	BDL	BDL	BDL	BDL
1992 APR	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAY	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL	BDL
1992 SEP	BDL	BDL	BDL	BDL	BDL	BDL
1992 NOV	BDL	BDL	BDL	BDL	BDL	BDL
ALUMINUM (UG/L)					GUIDELINE = 100 (46)	
1991 JUN	17.000	57.000	49.000	49.000	49.000	49.000
1991 JUL	13.000	67.000	59.000	59.000	59.000	59.000
1991 AUG	7.900	86.000	100.000	100.000	100.000	100.000
1991 SEP	19.000	52.000	49.000	49.000	49.000	49.000
1991 OCT	34.000	140.000	140.000	140.000	140.000	140.000
1991 NOV	52.630 <T	79.370 <T	61.000	61.000	61.000	61.000
1992 JAN	35.000	43.000	38.000	38.000	38.000	38.000
1992 FEB	8.600	39.000	38.000	38.000	38.000	38.000
1992 MAR	7.200	33.000	39.000	39.000	39.000	39.000
1992 APR	5.300	37.000	34.000	34.000	34.000	34.000
1992 MAY	18.000	38.000	34.000	34.000	34.000	34.000
1992 JUN	7.000	31.000	34.000	34.000	34.000	34.000
1992 SEP	9.200	39.000	56.000	56.000	56.000	56.000
1992 NOV	31.000	36.000	36.000	36.000	36.000	36.000

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED		DIST. SYSTEM SHIRLEY ST FREE FLOW		DIST. SYSTEM SHIRLEY ST STANDING	
METALS				DET'N LIMIT = 0.10		GUIDELINE = 25 (A1)	
ARSENIC (UG/L)							
1991 JUN	.830 <T	.340 <T	.330 <T				
1991 JUL	.610 <T	.170 <T	.150 <T				.150 <T
1991 AUG	.890 <T	.490 <T	.460 <T				.460 <T
1991 SEP	.910 <T	.400 <T	.310 <T				
1991 OCT	.910 <T	.710 <T	.610 <T				.560 <T
1991 NOV	BDL	.550 <T	.320 <T				.440 <T
1992 JAN	.870 <T	.160 <T	BDL				BDL
1992 FEB	1.100	.300 <T	.330 <T				.420 <T
1992 MAR	1.000 <T	.310 <T	.140 <T				BDL
1992 APR	.610 <T	BDL	.670 <T				.900 <T
1992 MAY	1.300	.590 <T					
1992 JUN	.710 <T	BDL					.280 <T
1992 SEP	.950 <T	.230 <T	.350 <T				.510 <T
1992 NOV	1.100	.280 <T	.400 <T				
BARIUM (UG/L)				DET'N LIMIT = 0.05		GUIDELINE = 1000 (A2)	
1991 JUN	22.000	21.000	20.000				
1991 JUL	22.000	22.000	22.000				23.000
1991 AUG	24.000	23.000	24.000				24.000
1991 SEP	24.000	22.000	23.000				
1991 OCT	21.000	21.000	20.000				21.000
1991 NOV	24.740	24.060	21.120				24.950
1992 JAN	24.000	22.000	22.000				24.000
1992 FEB	22.000	20.000	20.000				22.000
1992 MAR	26.000	24.000	24.000				23.000
1992 APR	22.000	20.000					
1992 MAY	25.000	24.000	23.000				26.000
1992 JUN	26.000	24.000					
1992 SEP	23.000	23.000	24.000				24.000
1992 NOV	24.000	22.000	21.000				24.000

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST		DIST. SYSTEM SHIRLEY ST STANDING
		FREE FLOW		
METALS				
BORON (UG/L)	DET'N LIMIT = 2.00		GUIDELINE = 5000 (A1)	
1991 JUN	25.000	24.000	25.000	
1991 JUL	29.000	29.000	30.000	33.000
1991 AUG	26.000	25.000	24.000	24.000
1991 SEP	25.000	25.000	25.000	
1991 OCT	28.000	29.000	28.000	28.000
1991 NOV	40.330	42.440	26.000	27.000
1992 JAN	26.000	26.000	25.000	27.000
1992 FEB	26.000	25.000	24.000	27.000
1992 MAR	25.000	26.000	27.000	37.000
1992 APR	27.000	28.000		
1992 MAY	26.000	26.000	25.000	27.000
1992 JUN	23.000	24.000		
1992 SEP	25.000	24.000	25.000	24.000
1992 NOV	30.000	30.000	29.000	30.000
BERYLLIUM (UG/L)				
		DET'N LIMIT = 0.05		GUIDELINE = 6800 (D4)
1991 JUN	BOL	BOL	BOL	
1991 JUL	BOL	BOL	BOL	BOL
1991 AUG	BOL	BOL	BOL	BOL
1991 SEP	BOL	BOL	BOL	
1991 OCT	BOL	BOL	BOL	BOL
1991 NOV	BOL	BOL	BOL	BOL
1992 JAN	BOL	BOL	BOL	BOL
1992 FEB	BOL	BOL	BOL	BOL
1992 MAR	BOL	BOL	BOL	BOL
1992 APR	BOL	BOL		
1992 MAY	BOL	BOL	BOL	BOL
1992 JUN	.110 <T	.130 <T		
1992 SEP	BOL	BOL	BOL	BOL
1992 NOV	BOL	BOL	BOL	BOL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW		DIST. SYSTEM SHIRLEY ST STANDING	
METALS						
CADMIUM (UG/L)						
DET'N LIMIT = 0.05						
GUIDELINE = 5.0 (A1)						
1991 JUN	BOL	BOL	BOL	BOL	BOL	
1991 JUL	BOL	BOL	BOL	BOL	BOL	
1991 AUG	BOL	BOL	BOL	BOL	BOL	
1991 SEP	BOL	BOL	BOL	BOL	BOL	
1991 OCT	BOL	BOL	BOL	BOL	BOL	
1991 NOV	BOL	BOL	BOL	BOL	BOL	
1992 JAN	BOL	BOL	BOL	BOL	BOL	
1992 FEB	BOL	BOL	BOL	BOL	BOL	
1992 MAR	BOL	BOL	BOL	BOL	BOL	
1992 APR	BOL	BOL	BOL	BOL	BOL	
1992 MAY	BOL	BOL	BOL	BOL	BOL	
1992 JUN	BOL	BOL	BOL	BOL	BOL	
1992 SEP	BOL	BOL	BOL	BOL	BOL	
1992 NOV	BOL	BOL	BOL	BOL	BOL	
COBALT (UG/L)						
DET'N LIMIT = 0.02						
GUIDELINE = N/A						
1991 JUN	.090 <T	.090 <T	.080 <T	.080 <T	.080 <T	
1991 JUL	.080 <T	.070 <T	.060 <T	.060 <T	.050 <T	
1991 AUG	.100 <T	.080 <T	.080 <T	.080 <T	.110 <T	
1991 SEP	.100 <T	.080 <T	.100 <T	.100 <T	.120 <T	
1991 OCT	.180 <T	.140 <T	.100 <T	.100 <T	.120 <T	
1991 NOV	.200 <T	.140 <T	.140 <T	.140 <T	.170 <T	
1992 JAN	.150 <T	.090 <T	.100 <T	.100 <T	.110 <T	
1992 FEB	.190 <T	.190 <T	.170 <T	.170 <T	.210 <T	
1992 MAR	.170 <T	.250 <T	.170 <T	.170 <T	.210 <T	
1992 APR	.190 <T	.230 <T	.270 <T	.270 <T	.100 <T	
1992 MAY	.240 <T	.260 <T	.140 <T	.140 <T	.780 <T	
1992 JUN	.200 <T	.140 <T	.240 <T	.240 <T	.210 <T	
1992 SEP	.210 <T	.210 <T	.130 <T	.130 <T	.210 <T	
1992 NOV	.220 <T	.150 <T	.130 <T	.130 <T	.190 <T	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
METALS			
CHROMIUM (UG/L)		DET'N LIMIT = 0.50	
1991 JUN	2,500 <T	2,100 <T	2,500 <T
1991 JUL	3,700 <T	3,500 <T	3,600 <T
1991 AUG	2,000 <T	1,200 <T	1,800 <T
1991 SEP	.860 <T	.890 <T	.750 <T
1991 OCT	2,700 <T	2,500 <T	2,300 <T
1991 NOV	5,990 <T	7,280 <T	.550 <T
1992 JAN	1,000 <T	1,000 <T	.830 <T
1992 FEB	.770 <T	.630 <T	BDL
1992 MAR	.630 <T	.580 <T	.690 <T
1992 APR	1,400 <T	1,500 <T	.760 <T
1992 MAY	.660 <T	.720 <T	.640 <T
1992 JUN	BDL	.620 <T	
1992 SEP	1,200 <T	.950 <T	.870 <T
1992 NOV	1,900 <T	2,000 <T	1,800 <T
COPPER (UG/L)		DET'N LIMIT = 0.50	
1991 JUN	1,000 <T	.920 <T	3,500 <T
1991 JUL	1,000 <T	1,100 <T	3,000 <T
1991 AUG	1,200 <T	1,200 <T	4,000 <T
1991 SEP	1,400 <T	.900 <T	3,300 <T
1991 OCT	1,400 <T	.820 <T	4,200 <T
1991 NOV	2,130 <T	2,200 <T	2,900 <T
1992 JAN	1,900 <T	1,100 <T	2,500 <T
1992 FEB	1,200 <T	1,300 <T	2,700 <T
1992 MAR	1,000 <T	.760 <T	4,800 <T
1992 APR	1,100 <T	.870 <T	
1992 MAY	1,400 <T	1,200 <T	4,700 <T
1992 JUN	1,500 <T	1,000 <T	
1992 SEP	.830 <T	.840 <T	4,800 <T
1992 NOV	1,100 <T	1,300 <T	3,800 <T

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

TREATMENT PLANT RAW TREATMENT PLANT TREATED TREATMENT PLANT DIST. SYSTEM SHIRLEY ST FREE FLOW DIST. SYSTEM SHIRLEY ST STANDING

IRON (UG/L) METALS DET'N LIMIT = 6.00 GUIDELINE = 300 (A3)

1991 JUN	22,000 <T	BOL	15,000 <T	9,500 <T
1991 JUL	20,000 <T	BOL	15,000 <T	21,000 <T
1991 AUG	13,000 <T	BOL	26,000 <T	
1991 SEP	21,000 <T	BOL	13,000 <T	
1991 OCT	45,000 <T	BOL	16,000 <T	18,000 <T
1991 NOV	40,700 <T	8,520 <T	12,000 <T	9,500 <T
1992 JAN	50,000 <T	BOL	10,000 <T	8,600 <T
1992 FEB	16,000 <T	8,000 <T	23,000 <T	26,000 <T
1992 MAR	13,000 <T	BOL	16,000 <T	BOL
1992 APR	9,000 <T	BOL	21,000 <T	44,000 <T
1992 MAY	28,000 <T	BOL		
1992 JUN	8,300 <T	BOL	190,000	50,000 <T
1992 SEP	15,000 <T	BOL	220,000	41,000 <T
1992 NOV	40,000 <T	BOL		

MERCURY (UG/L) DET'N LIMIT = 0.02 GUIDELINE = 1.0 (A1)

1991 JUN	BOL	BOL		
1991 JUL	BOL	BOL		
1991 AUG	BOL	BOL		
1991 SEP	BOL	BOL		
1991 OCT	BOL	BOL		
1991 NOV	BOL	BOL		
1992 JAN	BOL	.030 <T		
1992 FEB	BOL	BOL		
1992 MAR	BOL	BOL		
1992 APR	BOL	BOL		
1992 MAY	BOL	BOL		
1992 JUN	BOL	BOL		
1992 SEP	BOL	BOL		
1992 NOV	-040 <T	BOL		

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
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METALS

MANGANESE (UG/L) DET'N LIMIT = 0.05 GUIDELINE = 50.0 (A3)

1991 JUN	2.300	.400 <T	1.300	3.300
1991 JUL	2.400	.680	2.800	4.900
1991 AUG	1.700	.840	4.200	
1991 SEP	2.000	.360 <T	2.500	
1991 OCT	3.400	.440 <T	2.200	3.200
1991 NOV	BDL	BDL	1.600	.630
1992 JAN	4.500	.290 <T	1.400	2.400
1992 FEB	1.600	.600	2.400	2.800
1992 MAR	1.500	1.100	2.000	.250 <T
1992 APR	1.200	.270 <T		
1992 MAY	2.800	.750	1.900	4.700
1992 JUN	2.300	.360 <T		
1992 SEP	1.600	.340 <T	17.000	8.600
1992 NOV	3.500	.190 <T	15.000	3.400

MOLYBDENUM (UG/L) DET'N LIMIT = 0.05 GUIDELINE = N/A

1991 JUN	1.100	1.200	1.100	
1991 JUL	1.100	1.100	1.100	1.300
1991 AUG	.960	1.100	1.100	1.100
1991 SEP	1.000	1.100	1.100	
1991 OCT	1.000	1.200	1.100	1.100
1991 NOV	1.300	1.200	1.100	1.200
1992 JAN	1.100	1.200	1.300	1.200
1992 FEB	1.100	1.000	1.100	.960
1992 MAR	1.100	1.200	1.200	1.400
1992 APR	1.000	1.100		
1992 MAY	1.200	1.300	1.200	1.200
1992 JUN	.420 <T	.550		
1992 SEP	1.200	1.300	1.100	1.100
1992 NOV	1.100	1.100	.970	1.000

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	TREATMENT PLANT SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
METALS				
ANTIMONY (UG/L)		DET'N LIMIT = 0.05		
1991 JUN	.710	.660	.790	.790
1991 JUL	.710	.760	.690	.790
1991 AUG	.590	.420 <T	.780	.790
1991 SEP	.580	.630	.730	.790
1991 OCT	.670	.500 <T	.770	.750
1991 NOV	.760	.880	.730	.760
1992 JAN	.760	.540	.550	.680
1992 FEB	.820	.670	.680	.970
1992 MAR	.640	.550	.590	.590
1992 APR	.470 <T	.500 <T	.500 <T	.550
1992 MAY	.460 <T	.370 <T	.280 <T	.550
1992 JUN	.360 <T	.280 <T	.650	1.000
1992 SEP	.520	.380 <T	.670	.780
1992 NOV	.630	.550		
SELENIUM (UG/L)		DET'N LIMIT = 1.00		
1991 JUN	BDL	BDL	BDL	.790
1991 JUL	BDL	BDL	BDL	BDL
1991 AUG	1.100 <T	1.300 <T	1.500 <T	1.300 <T
1991 SEP	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	1.100 <T
1991 NOV	BDL	BDL	BDL	BDL
1992 JAN	BDL	1.100 <T	1.200 <T	1.200 <T
1992 FEB	1.300 <T	BDL	BDL	BDL
1992 MAR	BDL	BDL	BDL	BDL
1992 APR	BDL	BDL	BDL	BDL
1992 MAY	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL
1992 SEP	BDL	1.300 <T	1.300 <T	1.400 <T
1992 NOV	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING	METALS	
				STRONTIUM (UG/L)	GUIDELINE = N/A
				DET'N LIMIT = 0.10	
1991 JUN	170.000	170.000	170.000	170.000	
1991 JUL	170.000	170.000	170.000	170.000	180.000
1991 AUG	180.000	180.000	180.000	180.000	190.000
1991 SEP	180.000	180.000	180.000	180.000	
1991 OCT	170.000	170.000	170.000	170.000	170.000
1991 NOV	181.790	187.670	180.000	180.000	190.000
1992 JAN	190.000	190.000	180.000	180.000	190.000
1992 FEB	180.000	180.000	180.000	180.000	180.000
1992 MAR	200.000	200.000	200.000	200.000	190.000
1992 APR	160.000	160.000	190.000	190.000	200.000
1992 MAY	190.000	190.000	180.000	180.000	
1992 JUN	190.000	190.000	180.000	180.000	180.000
1992 SEP	180.000	180.000	190.000	190.000	
1992 NOV	180.000	180.000			
				TITANIUM (UG/L)	GUIDELINE = N/A
				DET'N LIMIT = 0.50	
1991 JUN	2.700 <T	1.300 <T	1.300 <T	1.300 <T	
1991 JUL	1.300 <T	BOL	BOL	BOL	BOL
1991 AUG	.600 <T	BOL	BOL	BOL	BOL
1991 SEP	1.700 <T	.530 <T	BOL	BOL	
1991 OCT	2.900 <T	.700 <T	.640 <T	.640 <T	.720 <T
1991 NOV	3.970 <T	1.390 <T	.880 <T	.880 <T	.800 <T
1992 JAN	2.500 <T	1.000 <T	.740 <T	.740 <T	.760 <T
1992 FEB	1.500 <T	.890 <T	1.100 <T	1.100 <T	.990 <T
1992 MAR	4.000 <T	3.500 <T	3.900 <T	3.900 <T	3.500 <T
1992 APR	4.000 <T	3.900 <T	3.500 <T	3.500 <T	3.400 <T
1992 MAY	4.600 <T	3.600 <T	3.600 <T	3.600 <T	
1992 JUN	2.300 <T	1.900 <T	.710 <T	.710 <T	.780 <T
1992 SEP	1.300 <T	.660 <T	.990 <T	.990 <T	.870 <T
1992 NOV	2.500 <T	1.000 <T			
				THALLIUM (UG/L)	GUIDELINE = 13 (04)
				DET'N LIMIT = 0.05	
50 SAMPLES	BOL	BOL	BOL	BOL	BOL

GUIDELINE = 13 (04)

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

METALS		DET'N LIMIT = 0.05		GUIDELINE = 100 (A1)	
URANIUM (UG/L)					
1991 JUN	.330 <T	.250 <T	.230 <T	.190 <T	.190 <T
1991 JUL	.300 <T	.190 <T	.180 <T	.220 <T	.220 <T
1991 AUG	.270 <T	.240 <T	.250 <T	.190 <T	.280 <T
1991 SEP	.320 <T	.190 <T	.300 <T	.070 <T	.250 <T
1991 OCT	.340 <T	.300 <T	.630	.220 <T	.290 <T
1991 NOV	.410 <T	.310 <T	.250 <T	.100 <T	.090 <T
1992 JAN	.420 <T	.280 <T	.240 <T	.130 <T	.130 <T
1992 FEB	.300 <T	.230 <T	.240 <T		
1992 MAR	.360 <T	.200 <T			
1992 APR	.350 <T	.150 <T	BDL		
1992 MAY	.340 <T	.090 <T			
1992 JUN	.210 <T	.110 <T			
1992 SEP	.300 <T	.070 <T			
1992 NOV	.290 <T	.130 <T			
VANADIUM (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = N/A	
1991 JUN	.090 <T	.340 <T	.290 <T	.410 <T	.320 <T
1991 JUL	BDL	BDL	BDL	.080 <T	.370 <T
1991 AUG	.260 <T	.460 <T	.490 <T	.450 <T	.440 <T
1991 SEP	.210 <T	.600	.380 <T	.210 <T	.210 <T
1991 OCT	.290 <T	.390 <T	.380 <T		
1991 NOV	.120 <T	.260 <T	.230 <T		
1992 JAN	.120 <T	.160 <T	.060 <T		
1992 FEB	.180 <T	.320 <T	.290 <T		
1992 MAR	.340 <T	.540	.380 <T		
1992 APR	BDL	.390 <T			
1992 MAY	.130 <T	.620	.440 <T		
1992 JUN	BDL	.080 <T			
1992 SEP	.210 <T	.560			
1992 NOV	.130 <T	.370 <T	.340 <T		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBOURG WTP

ZINC (UG/L)	TREATMENT PLANT		DIST. SYSTEM		DIST. SYSTEM SHIRLEY ST STANDING	GUIDELINE = 5000 (A3)
	RAW	TREATED	SHIRLEY ST FREE FLOW			
METALS						
			DET'N LIMIT = 0.20			
1991 JUN	3.200	7.200	21.000		33.000	
1991 JUL	3.000	2.400	2.900		71.000	
1991 AUG	2.200	1.400 <T	3.400			
1991 SEP	1.100 <T	.630 <T	1.900 <T			
1991 OCT	1.800 <T	.840 <T	2.100		64.000	
1991 NOV	2.500 <T	2.560 <T	3.500		19.000	
1992 JAN	2.900	2.700	3.100		52.000	
1992 FEB	4.500	3.200	4.500		170.000	
1992 MAR	2.100	3.000	5.400		3.100	
1992 APR	1.400 <T	1.600 <T			130.000	
1992 MAY	2.600	3.300	4.800			
1992 JUN	2.000 <T	2.400			17.000	
1992 SEP	1.600 <T	2.400	4.700			
1992 NOV	2.000 <T	11.000	13.000		24.000	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
CHLOROAROMATICS			
HEXACHLOROBUTADIENE (NG/L)			
30 SAMPLES	BDL	BDL	DET'N LIMIT = 1,000 GUIDELINE = 450 (D4)
123-TRICHLOROBENZENE (NG/L)			
30 SAMPLES	BDL	BDL	DET'N LIMIT = 5,000 GUIDELINE = N/A
1234-TETCHLOROBENZENE (NG/L)			
30 SAMPLES	BDL	BDL	DET'N LIMIT = 1,000 GUIDELINE = N/A
1235-TETCHLOROBENZENE (NG/L)			
30 SAMPLES	BDL	BDL	DET'N LIMIT = 1,000 GUIDELINE = N/A
124-TRICHLOROBENZENE (NG/L)			
30 SAMPLES	BDL	BDL	DET'N LIMIT = 5,000 GUIDELINE = 10000 (I)
1245-TETCHLOROBENZENE (NG/L)			
30 SAMPLES	BDL	BDL	DET'N LIMIT = 1,000 GUIDELINE = 38000 (D4)
135-TRICHLOROBENZENE (NG/L)			
30 SAMPLES	BDL	BDL	DET'N LIMIT = 5,000 GUIDELINE = N/A
HEXACHLOROBENZENE (NG/L)			
30 SAMPLES	BDL	BDL	DET'N LIMIT = 1,000 GUIDELINE = 10 (C1)
HEXACHLOROETHANE (NG/L)			
30 SAMPLES	BDL	BDL	DET'N LIMIT = 1,000 GUIDELINE = 1900 (D4)
1991 JUN	BDL	5,000 <T	5,000 <T
1991 JUL	IAW	IAW	IAW
1991 AUG	IAW	IAW	IAW
1991 SEP	IAW	IAW	IAW
1991 OCT	BDL	ISM	BDL
1991 NOV	BDL	BDL	BDL
1992 JAN	BDL	1,000 <T	BDL
1992 FEB	BDL	BDL	BDL
1992 MAR	BDL	5,000 <T	BDL
1992 APR	BDL	1,000 <T	BDL
1992 MAY	BDL	BDL	BDL
1992 JUN	BDL	2,000 <T	BDL
1992 SEP	BDL	BDL	BDL
1992 NOV	BDL	BDL	2,000 <T

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING	
CHLOROAROMATICS				
OCTACHLOROSTYRENE (NG/L)		DET'N LIMIT = 1,000	GUIDELINE = N/A	
30 SAMPLES	BDL	BDL	BDL	
PENTACHLOROBENZENE (NG/L)		DET'N LIMIT = 1,000	GUIDELINE = 74000 (D4)	
30 SAMPLES	BDL	BDL		
236-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5,000	GUIDELINE = N/A	
30 SAMPLES	BDL	BDL		
245-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5,000	GUIDELINE = N/A	
1991 JUN	BDL	BDL		
1991 JUL	IAW	IAW		
1991 AUG	IAW	IAW		
1991 SEP	IAW	IAW		
1991 OCT	BDL	BDL		
1991 NOV	BDL	BDL		
1992 JAN	BDL	BDL		
1992 FEB	BDL	BDL		
1992 MAR	BDL	BDL		
1992 APR	BDL	BDL		
1992 MAY	BDL	BDL		
1992 JUN	43,000 <T			
1992 SEP	BDL	BDL		
1992 NOV	BDL	BDL		
26A-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5,000	GUIDELINE = N/A	
30 SAMPLES	BDL	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DET. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING	
CHLOROPHENOLS				
234-TRICHLOROPHENOL (NG/L)		DET. N LIMIT = 100.0		GUIDELINE = N/A
2 SAMPLES	BDL			
2345-TETCHLOROPHENOL (NG/L)		DET. N LIMIT = 20.0		GUIDELINE = N/A
2 SAMPLES	BDL			
2356-TETCHLOROPHENOL (NG/L)		DET. N LIMIT = 10.0		GUIDELINE = N/A
2 SAMPLES	BDL			
245-TRICHLOROPHENOL (NG/L)		DET. N LIMIT = 100.0		GUIDELINE = 2600000 (04)
2 SAMPLES	BDL			
246-TRICHLOROPHENOL (NG/L)		DET. N LIMIT = 20.0		GUIDELINE = 5000 (A1)
2 SAMPLES	BDL			
PENTACHLOROPHENOL (NG/L)		DET. N LIMIT = 10.00		GUIDELINE = 60000 (A1)
2 SAMPLES	BDL			

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COROUG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
PESTICIDES AND PCB			
ALDRIN (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = 700 (A1)
30 SAMPLES	BOL	BOL	
ALPHA BHC (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = 700 (G)
1991 JUN	BOL	BOL	
1991 JUL	IAW	IAW	
1991 AUG	IAW	IAW	
1991 SEP	IAW	IAW	
1991 OCT	BOL	BOL	
1991 NOV	BOL	2.000 <T	
1992 JAN	1.000 <T	1.000 <T	
1992 FEB	1.000 <T	BOL	
1992 MAR	1.000 <T	1.000 <T	
1992 APR	1.000 <T	2.000 <T	
1992 MAY	BOL	BOL	
1992 JUN	1.000 <T	1.000 <T	
1992 SEP	BOL	BOL	
1992 NOV	1.000 <T	1.000 <T	
BETA BHC (NG/L)		DET'N LIMIT = 1.00	GUIDELINE = 300 (G)
30 SAMPLES	BOL	BOL	
LINDANE (GAMMA BHC) (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = 4000 (A1)
30 SAMPLES	BOL	BOL	
ALPHA CHLORDANE (NG/L)		DET'N LIMIT = 2.000	GUIDELINE = 7000 (A1)
30 SAMPLES	BOL	BOL	
GAMMA CHLORDANE (NG/L)		DET'N LIMIT = 2.00	GUIDELINE = 7000 (A1)
30 SAMPLES	BOL	BOL	
DIELDRIN (NG/L)		DET'N LIMIT = 2.00	GUIDELINE = 700 (A1)
30 SAMPLES	BOL	BOL	
METHOXYCHLOR (NG/L)		DET'N LIMIT = 5.0	GUIDELINE = 900000 (A1)
30 SAMPLES	BOL	BOL	
ENDOSULFAN 1 (NG/L)		DET'N LIMIT = 2.00	GUIDELINE = 74000 (D4)
30 SAMPLES	BOL	BOL	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBBOURG WTP

PESTICIDES AND PCB				DET'N LIMIT = 5.000	GUIDELINE = 74000 (D4)
ENDOSULFAN 11 (NG/L)	BOL	BOL	BOL		
30 SAMPLES					
ENORIN (NG/L)	BOL	BOL	BOL	DET'N LIMIT = 5.000	GUIDELINE = 1600 (D3)
30 SAMPLES					
ENDOSULFAN SULPHATE (NG/L)	BOL	BOL	BOL	DET'N LIMIT = 5.00	GUIDELINE = N/A
30 SAMPLES					
HEPTACHLOR EPOXIDE (NG/L)	BOL	BOL	BOL	DET'N LIMIT = 1.000	GUIDELINE = 3000 (A1)
16 SAMPLES					
HEPTACHLOR (NG/L)	BOL	BOL	BOL	DET'N LIMIT = 1.000	GUIDELINE = 3000 (A1)
30 SAMPLES					
MIREX (NG/L)	BOL	BOL	BOL	DET'N LIMIT = 5.000	GUIDELINE = N/A
30 SAMPLES					
OXYCHLORDANE (NG/L)	BOL	BOL	BOL	DET'N LIMIT = 2.000	GUIDELINE = N/A
30 SAMPLES					
O,P-DDT (NG/L)	BOL	BOL	BOL	DET'N LIMIT = 5.000	GUIDELINE = 30000 (A1)
30 SAMPLES					
PCB (NG/L)	BOL	BOL	BOL	DET'N LIMIT = 20.00	GUIDELINE = 3000 (A2)
30 SAMPLES					
P,P-DDD (NG/L)	BOL	BOL	BOL	DET'N LIMIT = 5.000	GUIDELINE = 30000 (A1)
30 SAMPLES					
P,P-DDD (NG/L)	BOL	BOL	BOL	DET'N LIMIT = 1.000	GUIDELINE = 30000 (A1)
30 SAMPLES					
P,P-DDT (NG/L)	BOL	BOL	BOL	DET'N LIMIT = 5.000	GUIDELINE = 30000 (A1)
30 SAMPLES					

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COROUG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
PESTICIDES AND PCB			
TOXAPHENE (NG/L)		DET'N LIMIT = 500.0	GUIDELINE = 5000 (A1)
30 SAMPLES	BDL	BDL	
AMETHRINE (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = 300000 (D3)
18 SAMPLES	BDL		
ATRAZINE (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = 60000 (A2)
1991 JUN	IAW	IAW	
1991 JUL	IAW	IAW	
1991 AUG	IAW	IAW	
1991 SEP	IAW	IAW	
1991 OCT	IAW	IAW	
1991 NOV	110.000 <T	130.000 <T	
1992 JAN	120.000 <T	110.000 <T	
1992 FEB	150.000 <T	160.000 <T	
1992 MAR	70.000 <T	64.000 <T	
1992 APR	120.000 <T	120.000 <T	
1992 MAY	110.000 <T	100.000 <T	
1992 JUN	110.000 <T	100.000 <T	
1992 SEP	130.000 <T	110.000 <T	
1992 NOV	70.000 <T	90.000 <T	
ATRAZONE (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = N/A
18 SAMPLES	BDL	BDL	
CYANAZINE (BLADEX) (NG/L)		DET'N LIMIT = 100.0	GUIDELINE = 10000 (A2)
18 SAMPLES	BDL	BDL	
DESETHYL ATRAZINE (NG/L)		DET'N LIMIT = 200.0	GUIDELINE = 60000 (A2)
18 SAMPLES	BDL	BDL	
DESETHYL SIMAZINE (NG/L)		DET'N LIMIT = 200.0	GUIDELINE = 10000 (A2)
18 SAMPLES	BDL	BDL	
PROMETONE (NG/L)		DET'N LIMIT = 50.000	GUIDELINE = 52500 (D3)
18 SAMPLES	BDL	BDL	
PROPAGINE (NG/L)		DET'N LIMIT = 50.000	GUIDELINE = 700000 (D3)
18 SAMPLES	BDL	BDL	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
PESTICIDES AND PCB			
PROMETRYNE (NG/L)		DET'N LIMIT = 50.000	GUIDELINE = 1000 (A2)
18 SAMPLES	BDL		
METIBUZIN (SENCOR) (NG/L)		DET'N LIMIT = 100.0	GUIDELINE = 80000 (A1)
18 SAMPLES	BDL		
SIMAZINE (NG/L)		DET'N LIMIT = 50.00	GUIDELINE = 10000 (A2)
18 SAMPLES	BDL		
ALACHLOR (LASSO) (NG/L)		DET'N LIMIT = 500.0	GUIDELINE = 5000 (A2)
18 SAMPLES	BDL		
METOLACHLOR (NG/L)		DET'N LIMIT = 500.0	GUIDELINE = 50000 (A2)
18 SAMPLES	BDL		
HEXACHLOROCYCLOPENTADIEN (NG/L)		DET'N LIMIT = 5.00	GUIDELINE = 206000 (D4)
1991 JUN	BDL	BDL	
1991 JUL	!AW	!AW	
1991 AUG	!AW	!AW	
1991 SEP	!AW	!AW	
1991 OCT	BDL	BDL	
1991 NOV	BDL	8.000 <T	
1992 JAN	BDL	10.000 <T	
1992 FEB	BDL	!QU	
1992 MAR	!QU	!QU	
1992 APR	!QU	!QU	
1992 MAY	!QU	!QU	
1992 JUN	!QU	!QU	
1992 SEP	!QU	!QU	
1992 NOV	!QU	!QU	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBourg WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING	PHENOLICS)	DET'N LIMIT =	0.2	GUIDELINE = N/A
1991 JUN	.400 <T	.400 <T	.400 <T	PHENOLICS			
1991 JUL	.200 <T	.600 <T	.600 <T)			
1991 AUG	.400 <T	.200 <T	.200 <T				
1991 SEP	.400 <T	1.400	.400 <T				
1991 OCT	.600 <T	.400 <T	.400 <T				
1991 NOV	1.200	.800 <T	.800 <T				
1992 JAN	BOL	BOL	BOL				
1992 FEB	BOL	BOL	BOL				
1992 MAR	BOL	BOL	BOL				
1992 APR	BOL	.600 <T	.600 <T				
1992 MAY	BOL	BOL	BOL				
1992 JUN	.800 <T	.600 <T	.600 <T				
1992 SEP	BOL	.400 <T	.400 <T				
1992 NOV	BOL	BOL	BOL				

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING	
POLYAROMATIC HYDROCARBONS				
PHENANTHRENE (NG/L)		DET'N LIMIT = 10.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		

ANTHRACENE (NG/L)		DET'N LIMIT = 1.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		

FLUORANTHENE (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = 42000 (D4)	
7 SAMPLES	BDL	BDL		

PYRENE (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		

BENZO(A)ANTHRACENE (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		

CHRYSENE (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		

DIMETH. BENZ(A)ANTHR (NG/L)		DET'N LIMIT = 5.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		

BENZO(E) PYRENE (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		

BENZO(B) FLUORANTHENE (NG/L)		DET'N LIMIT = 10.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		

PERYLENE (NG/L)		DET'N LIMIT = 10.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		

BENZO(K) FLUORANTHENE (NG/L)		DET'N LIMIT = 1.0	GUIDELINE = N/A	
7 SAMPLES	BDL	BDL		

BENZO(A) PYRENE (NG/L)		DET'N LIMIT = 5.0	GUIDELINE = 10 (A1)	
7 SAMPLES	BDL	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING	
POLYAROMATIC HYDROCARBONS				
BENZO(G,H,I) PERYLEN (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A
7 SAMPLES	BDL	BDL		
DIBENZO(A,H) ANTHRAC (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A
7 SAMPLES	BDL	BDL		
INDENO(1,2,3-C,D) PY (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A
7 SAMPLES	BDL	BDL		
BENZO(B) CHRYSENE (NG/L)		DET'N LIMIT = 2.0		GUIDELINE = N/A
7 SAMPLES	BDL	BDL		
CORONENE (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A
7 SAMPLES	BDL	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING	
SPECIFIC PESTICIDES				
2,4,5-T (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = 280000 (A1)	
2 SAMPLES	BDL			BDL
2,4-D (NG/L)		DET'N LIMIT = 100.0	GUIDELINE = 100000 (A1)	
2 SAMPLES	BDL			BDL
2,4-DB (NG/L)		DET'N LIMIT = 200.0	GUIDELINE = N/A	
2 SAMPLES	BDL			BDL
2,4 D PROPIONIC ACID (NG/L)		DET'N LIMIT = 100.0	GUIDELINE = N/A	
2 SAMPLES	BDL			BDL
DICAMBA (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = 120000 (A1)	
2 SAMPLES	BDL			BDL
2,4,5-TP (STLVE) (NG/L)		DET'N LIMIT = 20.00	GUIDELINE = 10000 (A1)	
2 SAMPLES	BDL			BDL
DIAZINON (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = 20000 (A1)	
2 SAMPLES	BDL			BDL
DICHLOROVOS (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = N/A	
2 SAMPLES	BDL			BDL
CHLORPYRIFOS (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = N/A	
2 SAMPLES	BDL			BDL
ETHION (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = 35000 (G)	
2 SAMPLES	BDL			BDL
MALATHION (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = 190000 (A1)	
2 SAMPLES	BDL			BDL
HEVINPHOS (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = N/A	
2 SAMPLES	BDL			BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING	
SPECIFIC PESTICIDES				
METHYL PARATHION (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = 9000 (03)	
2 SAMPLES	BDL			
METHYLTRITHION (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = N/A	
2 SAMPLES	BDL			
PARATHION (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = 50000 (A1)	
2 SAMPLES	BDL			
PHORATE (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = 2000 (A2)	
2 SAMPLES	BDL			
RELDAN (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = N/A	
2 SAMPLES	BDL			
RONNEL (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = N/A	
2 SAMPLES	BDL			
CARBOFURAN (NG/L)		DET'N LIMIT = 2000.0	GUIDELINE = 90000 (A1)	
2 SAMPLES	BDL			
CHLOROPHAPH (CIPC) (NG/L)		DET'N LIMIT = 2000.0	GUIDELINE = 350000 (G)	
2 SAMPLES	BDL			
DIALATE (NG/L)		DET'N LIMIT = 2000.0	GUIDELINE = N/A	
2 SAMPLES	BDL			
EPTAM (NG/L)		DET'N LIMIT = 2000.0	GUIDELINE = N/A	
2 SAMPLES	BDL			
IPC (NG/L)		DET'N LIMIT = 2000.0	GUIDELINE = N/A	
2 SAMPLES	BDL			
PROPOXUR (NG/L)		DET'N LIMIT = 2000.0	GUIDELINE = 140000 (03)	
2 SAMPLES	BDL			

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING

SPECIFIC PESTICIDES			
CARBARYL (NG/L)		DET'N LIMIT = 200.0	GUIDELINE = 90000 (A1)
2 SAMPLES	BDL		

BUTYLATE (NG/L)		DET'N LIMIT = 2000.0	GUIDELINE = 245000 (03)
2 SAMPLES	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
VOLATILES			
BENZENE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 5 (A1)
40 SAMPLES	BDL	BDL	
TOLUENE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 24 (A3)
1991 JUN	BDL	BDL	
1991 JUL	BDL	.050 <T	
1991 AUG	BDL	.050 <T	
1991 SEP	BDL	BDL	
1991 OCT	BDL	BDL	
1991 NOV	BDL	BDL	
1992 JAN	BDL	.050 <T	
1992 FEB	BDL	BDL	
1992 MAR	BDL	BDL	
1992 APR	BDL	BDL	
1992 MAY	BDL	.050 <T	
1992 JUN	BDL	BDL	
1992 SEP	BDL	BDL	
1992 NOV	BDL	BDL	
ETHYLBENZENE (UG/L)			
		DET'N LIMIT = 0.05	GUIDELINE = 2.4 (A3)
1991 JUN	BDL	BDL	
1991 JUL	BDL	.100 <T	
1991 AUG	BDL	BDL	
1991 SEP	.050 <T	BDL	
1991 OCT	BDL	.050 <T	
1991 NOV	BDL	.100 <T	
1992 JAN	BDL	.100 <T	
1992 FEB	.050 <T	BDL	
1992 MAR	BDL	.100 <T	
1992 APR	BDL	.150 <T	
1992 MAY	.050 <T	.100 <T	
1992 JUN	.100 <T	.150 <T	
1992 SEP	.100 <T	.250 <T	
1992 NOV	BDL	.050 <T	
P-XYLENE (UG/L)			
		DET'N LIMIT = 0.10	GUIDELINE = 300 (A3*)
40 SAMPLES	BDL	BDL	
M-XYLENE (UG/L)			
		DET'N LIMIT = 0.10	GUIDELINE = 300 (A3*)
40 SAMPLES	BDL	BDL	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING	
VOLATILES				
O-XYLENE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 300 (A3*)	
1991 JUN	BOL	BOL	.	
1991 JUL	BOL	BOL	.	
1991 AUG	BOL	BOL	.	
1991 SEP	.050 <T	BOL	.	
1991 OCT	BOL	BOL	.	
1991 NOV	BOL	BOL	.	
1992 JAN	BOL	BOL	.	
1992 FEB	BOL	BOL	.	
1992 MAR	BOL	BOL	.	
1992 APR	BOL	BOL	.	
1992 MAY	BOL	BOL	.	
1992 JUN	BOL	BOL	.	
1992 SEP	BOL	BOL	.	
1992 NOV	BOL	BOL	.	
STYRENE (UG/L)				
		DET'N LIMIT = 0.05	GUIDELINE = 100 (D1)	
1991 JUN	BOL	BOL	.	
1991 JUL	.150 <T	BOL	.	
1991 AUG	BOL	.050 <T	.	
1991 SEP	.100 <T	.150 <T	.	
1991 OCT	BOL	BOL	.	
1991 NOV	.050 <T	.200 <T	.	
1992 JAN	BOL	.100 <T	.	
1992 FEB	.100 <T	.150 <T	.	
1992 MAR	BOL	BOL	.	
1992 APR	.100 <T	.150 <T	.	
1992 MAY	.200 <T	.150 <T	.	
1992 JUN	.150 <T	.050 <T	.	
1992 SEP	.150 <T	.250 <T	.	
1992 NOV	.100 <T	BOL	.	
1,1-DICHLOROETHYLENE (UG/L)				
		DET'N LIMIT = 0.100	GUIDELINE = 7 (D1)	
40 SAMPLES	BOL	BOL	.	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
VOLATILES			
METHYLENE CHLORIDE (UG/L)		DET'M LIMIT = 0.50	GUIDELINE = 50 (A1)
1991 JUN	BDL	BDL	-
1991 JUL	BDL	BDL	-
1991 AUG	BDL	BDL	-
1991 SEP	BDL	BDL	-
1991 OCT	BDL	BDL	-
1991 NOV	BDL	BDL	-
1991 NOV	BDL	BDL	-
1992 JAN	BDL	BDL	-
1992 FEB	BDL	3.000 <T	3.000 <T
1992 MAR	BDL	3.500 <T	3.500 <T
1992 APR	BDL	4.500 <T	-
1992 MAY	BDL	4.500 <T	4.500 <T
1992 JUN	BDL	BDL	-
1992 SEP	BDL	3.000 <T	3.500 <T
1992 NOV	BDL	1.500 <T	1.500 <T
T12-DICHLOROETHYLENE (UG/L)		DET'M LIMIT = 0.10	GUIDELINE = 70 (D1)
40 SAMPLES	BDL	BDL	-
1,1-DICHLOROETHANE (UG/L)		DET'M LIMIT = 0.100	GUIDELINE = N/A
40 SAMPLES	BDL	BDL	-
CHLOROFORM (UG/L)		DET'M LIMIT = 0.10	GUIDELINE = 350 (A1+)
1991 JUN	BDL	3.200	4.000
1991 JUL	BDL	4.600	4.800
1991 AUG	BDL	10.500	7.500
1991 SEP	BDL	6.700	3.800
1991 OCT	BDL	9.900	6.100
1991 NOV	BDL	10.000	4.000
1992 JAN	BDL	8.700	3.900
1992 FEB	BDL	4.900	3.200
1992 MAR	BDL	9.100	4.600
1992 APR	BDL	9.200	-
1992 MAY	BDL	8.400	6.100
1992 JUN	BDL	10.600	-
1992 SEP	BDL	10.500	7.800
1992 NOV	BDL	11.800	10.300
111-TRICHLOROETHANE (UG/L)		DET'M LIMIT = 0.02	GUIDELINE = 200 (D1)
40 SAMPLES	BDL	BDL	-

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBBOURG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING	
VOLATILES				
1,2-DICHLOROETHANE (UG/L)				
40 SAMPLES	BDL	BDL	BDL	GUIDELINE = 5 (A1)
CARBON TETRACHLORIDE (UG/L)				
40 SAMPLES	BDL	BDL	BDL	GUIDELINE = 5 (A1)
1,2-DICHLOROPROPANE (UG/L)				
40 SAMPLES	BDL	BDL	BDL	GUIDELINE = 5 (D1)
TRICHLOROETHYLENE (UG/L)				
40 SAMPLES	BDL	BDL	BDL	GUIDELINE = 50 (A1)
DICHLOROBROMOMETHANE (UG/L)				
40 SAMPLES	BDL	BDL	BDL	GUIDELINE = 350 (A1+)
1991 JUN	BDL	4,200	4,000	-
1991 JUL	BDL	5,300	4,750	-
1991 AUG	BDL	9,700	7,050	-
1991 SEP	BDL	7,450	4,100	-
1991 OCT	BDL	9,100	5,800	-
1991 NOV	BDL	9,400	4,200	-
1992 JAN	BDL	9,250	4,350	-
1992 FEB	BDL	6,350	3,400	-
1992 MAR	BDL	9,450	4,350	-
1992 APR	BDL	10,100	-	-
1992 MAY	BDL	7,800	5,500	-
1992 JUN	BDL	10,100	-	-
1992 SEP	BDL	9,450	7,150	-
1992 NOV	BDL	10,650	8,900	-
1,1,2-TRICHLOROETHANE (UG/L)				
40 SAMPLES	BDL	BDL	BDL	GUIDELINE = 0.6 (D4)

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
VOLATILES			
CHLORODIBROMOMETHANE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)
1991 JUN	2.800	2.800	.
1991 JUL	3.800	3.200	.
1991 AUG	6.000	4.600	.
1991 SEP	4.700	3.100	.
1991 OCT	6.700	4.600	.
1991 NOV	5.900	3.400	.
1992 JAN	7.000	4.000	.
1992 FEB	4.600	2.900	.
1992 MAR	6.100	2.800	.
1992 APR	9.300	.	.
1992 MAY	6.800	6.300	.
1992 JUN	5.700	.	.
1992 SEP	6.400	4.800	.
1992 NOV	5.500	4.900	.
TETRACHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 65 (A5)
40 SAMPLES	BOL	BOL	.
BROMOFORM (UG/L)		DET'N LIMIT = 0.20	GUIDELINE = 350 (A1+)
1991 JUN	.600 <T	.600 <T	.
1991 JUL	.800 <T	.600 <T	.
1991 AUG	.800 <T	.600 <T	.
1991 SEP	.800 <T	.600 <T	.
1991 OCT	1.200 <T	.800 <T	.
1991 NOV	1.000 <T	.600 <T	.
1992 JAN	BOL	BOL	.
1992 FEB	1.000 <T	.800 <T	.
1992 MAR	BOL	BOL	.
1992 APR	.800 <T	.	.
1992 MAY	BOL	BOL	.
1992 JUN	BOL	.	.
1992 SEP	.800 <T	.800 <T	.
1992 NOV	.600 <T	.600 <T	.
1,1,2,2-TETRACHLOROETHANE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 0.17 (O4)
40 SAMPLES	BOL	BOL	.
VINYL CHLORIDE (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = 2 (O1)
19 SAMPLES	BOL	BOL	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING
VOLATILES			
C12-DICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = 70 (D1)
19 SAMPLES	BDL	BDL	
CHLOROBENZENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 1510 (D3)
40 SAMPLES	BDL	BDL	
1,4-DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 5 (A1)
40 SAMPLES	BDL	BDL	
1,3-DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 3750 (D3)
40 SAMPLES	BDL	BDL	
1,2-DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 200 (A1)
40 SAMPLES	BDL	BDL	
ETHYLENE DIBROMIDE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 50 (D1)
40 SAMPLES	BDL	BDL	
TOTL TRIHALOMETHANES (UG/L)		DET'N LIMIT = 0.50	GUIDELINE = 350 (A1)
1991 JUN	BDL	11,300	
1991 JUL	BDL	13,350	
1991 AUG	BDL	19,750	
1991 SEP	BDL	11,600	
1991 OCT	BDL	17,300	
1991 NOV	BDL	12,200	
1992 JAN	BDL	24,950	
1992 FEB	BDL	10,200	
1992 MAR	BDL	11,750	
1992 APR	BDL	29,400	
1992 MAY	BDL	23,000	
1992 JUN	BDL	26,400	
1992 SEP	BDL	27,250	
1992 NOV	BDL	24,700	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 COBORG WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM SHIRLEY ST FREE FLOW	DIST. SYSTEM SHIRLEY ST STANDING	
RADIONUCLIDES				
COBALT 60 (BQ/L)		DET'M LIMIT = 0.70		GUIDELINE = N/A
2 SAMPLES	BDL		BDL	
CESIUM 134 (BQ/L)		DET'M LIMIT = 0.70		GUIDELINE = N/A
2 SAMPLES	BDL		BDL	
CESIUM 137 (BQ/L)		DET'M LIMIT = 0.70		GUIDELINE = 50 (A1)
2 SAMPLES	BDL		BDL	
GROSS ALPHA COUNT (BQ/L)		DET'M LIMIT = 0.04		GUIDELINE = 0.55 (D1)
1991 OCT	BDL		.050	
GROSS BETA COUNT (BQ/L)		DET'M LIMIT = 0.04		GUIDELINE = N/A
1991 OCT	.090		.110	
TRITIUM (BQ/L)		DET'M LIMIT = 7.00		GUIDELINE = 40000 (A1)
2 SAMPLES	BDL		BDL	
IODINE 131 (BQ/L)		DET'M LIMIT = 0.70		GUIDELINE = 10 (A1)
2 SAMPLES	BDL		BDL	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BACTERIOLOGICAL			
FECAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0 (A1)
STANDARD PLATE COUNT MEMBRANE FILT.	CT/ML	0	500/ML (A3)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100ML (A1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	0	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	0	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	0	N/A
FIELD PH	DMNSLESS	N/A	6.5-8.5 (A4)
FIELD TEMPERATURE	DEG.C	N/A	15.0 (A3)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	0.20	30-500 (A4)
AMMONIUM TOTAL	MG/L	0.002	0.05 (F2)
CALCIUM	MG/L	0.20	100.0 (F2)
CHLORIDE	MG/L	0.20	250.0 (A3)
COLOUR	TCU	0.50	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.00	400.0 (F2)
CYANIDE	MG/L	0.001	0.2 (A1)
DISSOLVED ORGANIC CARBON	MG/L	0.10	5.0 (A3)
FLUORIDE	MG/L	0.01	1.5* (A1)
HARDNESS	MG/L	0.50	80-100 (A4)
IONCAL	DMNSLESS	N/A	N/A
LANGELIERS INDEX	DMNSLESS	N/A	N/A
MAGNESIUM	MG/L	0.10	30.0 (F2)
NITRATES (TOTAL)	MG/L	0.005	10.0 (A1)
NITRITE	MG/L	0.001	1.0 (A1)
NITROGEN TOTAL KJELDAHL	MG/L	0.02	N/A
PH	DMNSLESS	N/A	6.5-8.5 (A4)
PHOSPHORUS FIL REACT	MG/L	0.0005	N/A
PHOSPHORUS TOTAL	MG/L	0.002	0.4 (F2)
POTASSIUM	MG/L	0.010	10.0 (F2)
RESIDUE FILTRATE (CALCULATED TDS)	MG/L	N/A	500.0 (A3)
SODIUM	MG/L	0.20	200.0 (A4)
SULPHATE	MG/L	0.20	500.0 (A4)
TURBIDITY	FTU	0.05	1.0 (A1)

* The Maximum Acceptable Concentration (MAC) for naturally occurring fluoride in drinking water is 2.4 mg/L.

CHLOROAROMATICS			
1,2,3-TRICHLOROBENZENE	NG/L	5.0	N/A
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,4-TRICHLOROBENZENE	NG/L	5.0	10000 (I)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.0	38000 (D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.0	N/A
2,3,6-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,4,5-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,6A-TRICHLOROTOLUENE	NG/L	5.0	N/A
HEXACHLOROBENZENE (HCB)	NG/L	1.0	10 (C1)
HEXACHLOROBUTADIENE	NG/L	1.0	450 (D4)
HEXACHLOROTHANE	NG/L	1.0	1900 (D4)
OCTACHLOROSTYRENE	NG/L	1.0	N/A
PENTACHLOROBENZENE	NG/L	1.0	74000 (D4)
CHLOROPHENOLS			
2,3,4-TRICHLOROPHENOL	NG/L	100.0	N/A
2,3,4,5-TETRACHLOROPHENOL	NG/L	20.0	N/A
2,3,5,6-TETRACHLOROPHENOL	NG/L	10.0	N/A

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
2,4,5-TRICHLOROPHENOL	NG/L	100.0	2600000 (D4)
2,4,6-TRICHLOROPHENOL	NG/L	20.0	5000 (A1)
PENTACHLOROPHENOL	NG/L	10.0	60000 (A1)
METALS			
ALUMINUM	UG/L	0.10	100 (A4)
ANTIMONY	UG/L	0.05	146 (D4)
ARSENIC	UG/L	0.10	25 (A1)
BARIUM	UG/L	0.05	1000 (A2)
BERYLLIUM	UG/L	0.05	6800 (D4)
BORON	UG/L	2.00	5000 (A1)
CADMIUM	UG/L	0.05	5 (A1)
CHROMIUM	UG/L	0.50	50 (A1)
COBALT	UG/L	0.02	N/A
COPPER	UG/L	0.50	1000 (A3)
IRON	UG/L	6.00	300 (A3)
LEAD	UG/L	0.05	10 (A1)
MANGANESE	UG/L	0.05	50 (A3)
MERCURY	UG/L	0.02	1 (A1)
MOLYBDENUM	UG/L	0.05	N/A
NICKEL	UG/L	0.20	350 (D3)
SELENIUM	UG/L	1.00	10 (A1)
SILVER	UG/L	0.05	N/A
STRONTIUM	UG/L	0.10	N/A
THALLIUM	UG/L	0.05	13 (D4)
TITANIUM	UG/L	0.50	N/A
URANIUM	UG/L	0.05	100 (A1)
VANADIUM	UG/L	0.05	N/A
ZINC	UG/L	0.20	5000 (A3)
POLYNUCLEAR AROMATIC HYDROCARBONS			
ANTHRACENE	NG/L	1.0	N/A
BENZO(A) ANTHRACENE	NG/L	20.0	N/A
BENZO(A) PYRENE	NG/L	5.0	10 (A1)
BENZO(B) CHRYSENE	NG/L	2.0	N/A
BENZO(B) FLUORANTHENE	NG/L	10.0	N/A
BENZO(E) PYRENE	NG/L	50.0	N/A
BENZO(G,H,I) PERYLENE	NG/L	20.0	N/A
BENZO(K) FLUORANTHENE	NG/L	1.0	N/A
CHRYSENE	NG/L	50.0	N/A
CORONENE	NG/L	10.0	N/A
DIBENZO(A,H) ANTHRACENE	NG/L	10.0	N/A
DIMETHYL BENZO(A) ANTHRACENE	NG/L	5.0	N/A
FLUORANTHENE	NG/L	20.0	42000 (D4)
INDENO(1,2,3-C,D) PYRENE	NG/L	20.0	N/A
PERYLENE	NG/L	10.0	N/A
PHENANTHRENE	NG/L	10.0	N/A
PYRENE	NG/L	20.0	N/A
PESTICIDES & PCB			
ALACHLOR (LASSO)	NG/L	500.0	5000 (A2)
ALDRIN	NG/L	1.0	700 (A1)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700 (G)
ALPHA CHLORDANE	NG/L	2.0	7000 (A1)
AMETRINE	NG/L	50.0	300000 (D3)
ATRATONE	NG/L	50.0	N/A
ATRAZINE	NG/L	50.0	60000 (A2)
DESETHYL ATRAZINE	NG/L	200.0	60000 (A2)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300 (G)
CYANAZINE (BLADEX)	NG/L	100.0	10000 (A2)
DIÉLDRIIN	NG/L	2.0	700 (A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000 (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	5.0	74000 (D4)
ENDOSULFAN SULPHATE (THIODAN SULPHATE)	NG/L	5.0	N/A

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
ENDRIN	NG/L	5.0	1600 (D3)
GAMMA CHLORDANE	NG/L	2.0	7000 (A1)
HEPTACHLOR	NG/L	1.0	3000 (A1)
HEPTACHLOR EPOXIDE	NG/L	1.0	3000 (A1)
HEXACHLOROCYCLOPENTADIENE	NG/L	5.0	206000 (D4)
LINDANE (GAMMA BHC)	NG/L	1.0	4000 (A1)
METHOXYCHLOR	NG/L	5.0	900000 (A1)
METOLACHLOR	NG/L	500.0	50000 (A2)
METRIBUZIN (SENCOR)	NG/L	100.0	80000 (A1)
MIREX	NG/L	5.0	N/A
P,P-DDD	NG/L	5.0	30000 (A1)
O,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDE	NG/L	1.0	30000 (A1)
OXYCHLORDANE	NG/L	2.0	N/A
PCB	NG/L	20.0	3000 (A2)
PROMETONE	NG/L	50.0	52500 (D3)
PROMETRYNE	NG/L	50.0	1000 (A2)
PROPAZINE	NG/L	50.0	700000 (D3)
SIMAZINE	NG/L	50.0	10000 (A2)
DESETHYL SIMAZINE	NG/L	200.0	10000 (A2)
TOXAPHENE	NG/L	500.0	5000 (A1)
PHENOLICS			
PHENOLICS (UNFILTERED REACTIVE)	UG/L	0.2	N/A
SPECIFIC PESTICIDES			
2,4 D PROPIONIC ACID	NG/L	100.0	N/A
2,4,5-TRICHLOROPHENOXY ACETIC ACID	NG/L	50.0	280000 (A1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.0	100000 (A1)
2,4-DICHLOROPHENOXYBUTYRIC ACID (2,4-DB)	NG/L	200.0	N/A
2,4,5-TP (SILVEX)	NG/L	20.0	10000 (A1)
BUTYLATE (SUTAN)	NG/L	2000.0	245000 (D3)
CARBARYL (SEVIN)	NG/L	200.0	90000 (A1)
CARBOFURAN	NG/L	2000.0	90000 (A1)
CHLOROPROPHAM (CIPC)	NG/L	2000.0	350000 (G)
CHLORPYRIFOS (DURSABAN)	NG/L	20.0	N/A
DIALATE	NG/L	2000.0	N/A
DIAZINON	NG/L	20.0	20000 (A1)
DICAMBA	NG/L	50.0	120000 (A1)
DICHLOROVOS	NG/L	20.0	N/A
EPTAM	NG/L	2000.0	N/A
ETHION	NG/L	20.0	35000 (G)
IPC	NG/L	2000.0	N/A
MALATHION	NG/L	20.0	190000 (A1)
METHYL PARATHION	NG/L	50.0	9000 (D3)
METHYLTRITHION	NG/L	20.0	N/A
MEVINPHOS	NG/L	20.0	N/A
PARATHION	NG/L	20.0	50000 (A1)
PHORATE (THIMET)	NG/L	20.0	2000 (A2)
PICHLORAM	NG/L	100.0	190000 (A2)
PROPOXUR (BAYGON)	NG/L	2000.0	140000 (D3)
RELDAN	NG/L	20.0	N/A
RONNEL	NG/L	20.0	N/A
VOLATILES			
1,1-DICHLOROETHANE	UG/L	0.10	N/A
1,1-DICHLOROETHYLENE	UG/L	0.10	7 (D1)
1,2-DICHLOROBENZENE	UG/L	0.05	200 (A1)
1,2-DICHLOROETHANE	UG/L	0.05	5 (A1)
1,2-DICHLOROPROPANE	UG/L	0.05	5 (D1)
1,3-DICHLOROBENZENE	UG/L	0.10	3750 (D3)
1,4-DICHLOROBENZENE	UG/L	0.10	5 (A1)
1,1,1-TRICHLOROETHANE	UG/L	0.02	200 (D1)
1,1,2-TRICHLOROETHANE	UG/L	0.05	0.6 (D4)
1,1,2,2-TETRACHLOROETHANE	UG/L	0.05	0.17 (D4)

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
-----	----	-----	-----
BENZENE	UG/L	0.05	5 (A1)
BROMOFORM	UG/L	0.20	350 (A1+)
CARBON TETRACHLORIDE	UG/L	0.20	5 (A1)
CHLOROBENZENE	UG/L	0.10	1510 (D3)
CHLORODIBROMOMETHANE	UG/L	0.10	350 (A1+)
CHLOROFORM	UG/L	0.10	350 (A1+)
CIS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
DICHLOROBROMOMETHANE	UG/L	0.05	350 (A1+)
ETHYLENE DIBROMIDE	UG/L	0.05	50 (D1)
ETHYLBENZENE	UG/L	0.05	2.4 (A3)
M-XYLENE	UG/L	0.10	300 (A3*)
METHYLENE CHLORIDE	UG/L	0.50	50 (A1)
O-XYLENE	UG/L	0.05	300 (A3*)
P-XYLENE	UG/L	0.10	300 (A3*)
STYRENE	UG/L	0.05	100 (D1)
TETRACHLOROETHYLENE	UG/L	0.05	65 (A5)
TRANS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
TOLUENE	UG/L	0.05	24 (A3)
TOTAL TRIHALOMETHANES	UG/L	0.50	350 (A1)
TRICHLOROETHYLENE	UG/L	0.10	50 (A1)
VINYL CHLORIDE	UG/L	0.10	2 (D1)
RADIONUCLIDES			
TRITIUM	BQ/L	7.0	40000 (A1)
GROSS ALPHA COUNT	BQ/L	0.04	0.55# (D1)
GROSS BETA COUNT	BQ/L	0.04	N/A
COBALT 60	BQ/L	0.70	N/A
CESIUM 134	BQ/L	0.70	N/A
CESIUM 137	BQ/L	0.70	50 (A1)
IODINE 131	BQ/L	0.70	10 (A1)

Equal to 15.0 Picocuries/litre

DRINKING WATER SURVEILLANCE PROGRAM
PROGRAM DESCRIPTION

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality;
- a flagging mechanism for guideline exceedance;
- a definition of contaminant levels and trends;
- a comprehensive background for remedial action;
- a framework for assessment of new contaminants; and
- an indication of treatment efficiency of plant processes.

PROGRAM

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. In 1992, 109 systems were being monitored. Water supply locations have been prioritized for surveillance based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit.

A major goal of the program is to collect valid water quality data in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analyzed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling, in order to acquire complete plant process and distribution system details and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of raw (ambient water) and treated water at the treatment plant and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled. Sampling is carried out by operational personnel who have been trained in applicable procedures.

Comprehensive standardized procedures and field test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". Most laboratory analyses are carried out by the Ministry of Environment and Energy (MOEE), Laboratory Services Branch. Radionuclides are analyzed by the Ministry of Labour.

DATA REPORTING MECHANISM

When the analytical results are transferred from the MOEE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOEE District Officer, the appropriate operational staff and are also retained by the DWSP unit.

PROGRAM INPUTS AND OUTPUTS

There are four major inputs and four major outputs in the program.

Program Input - Plant and Distribution System Description

The system description includes plant specific non-analytical information acquired through a questionnaire and an initial plant visit. During the initial assessment of the plant and distribution system, questionnaire content is verified and missing information added. It is intended that all data be kept current with scheduled annual updates.

The Plant and Distribution System Description consists of the following seven components:

1. PROCESS COMPONENT INVENTORY

All physical and chemical processes to which the water is subjected, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2. TREATMENT CHEMICALS

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. Chemical dosages applied on the day of sampling are recorded in DWSP.

3. PROCESS CONTROL MEASUREMENTS

Documentation of in-plant monitoring of process parameters (eg. turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. Except for the recorded Field Data, in-plant monitoring results are not retained in DWSP but are retained by the water treatment plant personnel.

4. DESIGN FLOW AND RETENTION TIME

Hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. Maximum, minimum and average flow, as well as a record of the flow rate on the day of sampling, are recorded in DWSP.

5. DISTRIBUTION SYSTEM DESCRIPTION

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

6. SAMPLING SYSTEM

Each plant is assessed for its adequacy in terms of the sampling of bacteriological, organic and inorganic parameters. Prime considerations in the assessment and design of the sampling system are:

- i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;
- ii/ the water being sampled is not being modified by the sampling system;
- iii/ the sample tap must be in a clean area of the plant, preferably a lab area; and
- iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap); pump characteristics (model, type, capacity); and flow rate.

7. PERSONNEL

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate MOEE personnel associated with the plant.

Program Input - Field Data

The second major input to DWSP is field data. Field data is collected at the plant and from the distribution system sites on the day of sampling. Field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling, as well as, monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analyzed according to standardized DWSP protocols to allow for interplant comparison.

Program Input - Laboratory Analytical Data

The third major input to DWSP is Laboratory Analytical Data. Samples gathered from the raw, treated and distribution sampling sites are analyzed for the presence of approximately 180 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. Parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments, parameters may be measured in a "scan" producing some results for parameters that are not on the DWSP priority list, but which may be of interest. The majority of parameters are measured on a routine basis. Those that are technically more difficult and/or costly to analyze, however, are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change, notation will be made and comparison data documented.

Program Input - Parameter Reference Information

The fourth major input to DWSP is Parameter Reference Information. This is a catalogue of information for each substance analyzed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database. An example is shown in figure 1.

Program output - Query

All DWSP information is easily accessed through the Query function, therefore, anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOEE offices is being developed by the DWSP group.

Program Output - Action Alerts

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the Ontario Drinking Water Objectives publication. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective, an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of the confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedances at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, guidelines/limits from other agencies are used. The Parameter Listing System, published by MOEE (ISBN 0-7729-4461-X), catalogues and keeps current guidelines for 650 parameters from agencies throughout the world. If these guidelines are exceeded, the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

Program Output - Report Generation

Custom reports can be generated from DWSP to meet MOEE Regional needs and to respond to public requests.

Program Output - Annual Reports

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG.1

PARAMETER REFERENCE INFORMATION

NAME: BENZENE

CAS#: 71-43-2

MOLECULAR FORMULAE: C_6H_6

DETECTION LIMIT: (FOR METHOD POCODO) 0.05 $\mu g/L$

SYNONYMS: BENZOL; BENZOLE; COAL NAPHTHA; CARBON OIL (27)
CYCLOHEXATRIENE (41)

CHARACTERISTICS: COLOURLESS TO LIGHT-YELLOW, MOBILE, NONPOLAR LIQUID, OF HIGHLY REFRACTIVE NATURE, AROMATIC ODOUR; VAPOURS BURN WITH SMOKING FLAME (30)

PROPERTIES: SOLUBILITY IN WATER: 1780-1800 mg/L AT 25C (41)
THRESHOLD ODOUR: 0.5 - 10 PPM IN WATER
THRESHOLD TASTE: 0.5 mg/L IN WATER (39)
ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING ORGANISMS AND APPEARS TO ACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT A HIGH LIPID CONTENT OR REPRESENT MAJOR METABOLIC SITES, SUCH AS LIVER OR BRAIN; SMALL QUANTITIES EVAPORATE FROM SOILS OR ARE DEGRADED RATHER QUICKLY (80)

SOURCES: COMMERCIAL: PETROLEUM REFINING; SOLVENT RECOVERY; COAL TAR DISTILLATION (39); FOOD PROCESSING AND TANNING INDUSTRIES; COMBUSTION OF CAR EXHAUST.
ENVIRONMENTAL: POSSIBLE SOURCE IS RUNOFF.

USES: DETERGENTS; NYLON; INTERMEDIATE IN PRODUCTION OF OTHER COMPOUNDS, SUCH AS PESTICIDES; SOLVENT FOR EXTRACTION AND RECTIFICATION IN RUBBER INDUSTRY; DEGREASING AND CLEANSING AGENT; GASOLINE.

REMOVAL: THE FOLLOWING PROCESSES HAVE BEEN SUCCESSFUL IN REMOVING BENZENE FROM WASTEWATER: GAC ADSORPTION, PRECIPITATION WITH ALUM AND SUBSEQUENT REMOVAL VIA SEDIMENTATION, COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION, OXIDATION

ADDITIONAL PROPERTIES: MOLECULAR WEIGHT: 78.12
MELTING POINT: 5.5°C (27)
BOILING POINT: 80.1°C (27)
SPECIFIC GRAVITY: 0.8790 AT 20°C (27)
VAPOUR PRESSURE: 100 MM AT 26.1°C (27)
HENRY'S LAW CONSTANT: 0.00555 ATM-M3/MOLE (41)
LOG OCT./WATER PARTITION COEFFICIENT: 1.95 TO 2.13 (39)
CARBON ADSORPTION: K=1.0; 1/N=1.6; R=0.97; PH=5.3 (41)
SEDIMENT/WATER PARTITION COEFFICIENT: NO DATA

Appendix B

DWSP SAMPLING GUIDELINE

i) Raw and Treated at Plant

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-220 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO_3) (Caution: HNO_3 is corrosive)
Volatiles (duplicates) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle -fill bottle completely without bubbles
Organics (OWOC), (OWTRI)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top
Specific Pesticides (OWCP), (PEOP), (PECAR)	-as per Organics -three extra bottles must be filled
Polyaromatic hydrocarbons (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -add 25 drops of sodium thiosulphate
Cyanide (Treated only)	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops sodium hydroxide (NaOH) (Caution: NaOH is corrosive)
Mercury	-250 mL glass bottle -rinse bottle and cap three times -fill to top of label -add 20 drops each nitric acid (HNO_3) and potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$) (Caution: HNO_3 & $\text{K}_2\text{Cr}_2\text{O}_7$ are corrosive)

Phenols	-250 mL glass bottle -do <u>not</u> rinse bottle, preservative has been added -fill to top of label
Radionuclides (as scheduled)	-4 L plastic jug -do <u>not</u> rinse, carrier added -fill to 5 cm from top
Organic Characterization (GC/MS - once per year) (PBVOL), (PBEXT)	-1 L amber glass bottle; instructions as per organic -250 mL glass bottle -do <u>not</u> rinse bottle -fill completely without bubbles

Steps:

1. Let sampling water tap run for an adequate time to clear the sample line.
2. Record time of day on submission sheet.
3. Record temperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.
6. No smoking in area of sample location.

ii) Distribution Samples (standing water)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO_3) (Caution: HNO_3 is corrosive)

Steps:

1. Record time of day on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.

5. Fill general chemistry and metals bottles.

6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-250 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid HNO_3 (Caution: HNO_3 is corrosive)
Volatiles (duplicate) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle, preservative has been added -fill bottle completely without bubbles
Organics (OWOC)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top
Polyaromatic Hydrocarbons (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -add 25 drops of sodium thiosulphate

Steps:

1. Record time of day on submission sheet.
2. Let cold water flow for five minutes.
3. Record temperature on submission sheet.
4. Fill all bottles as per instructions.
5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.



